Vanmark 2420/2421 Peeler/Washer
Parts and Service Manual

Vanmark Peelers/Washers are designed and built to provide long years of service with minimal maintenance. Operation is simple and easy to learn. However, it is important that operators be properly trained and that they use care to prevent injury to themselves and damage to the equipment.

This manual is provided with your Peeler/Washer as a guide for operation and as a maintenance aid. Please read and understand this manual before attempting to install, operate, service or repair your machine, as Vanmark does not assume any responsibility for work performed by unauthorized personnel. Drawings, parts and instructions are identified as right or left when facing the inlet of the machine or the direction of product flow. Parts, drawings, photographs and text are subject to change.

Always shut-off and lock-out electrical power before performing maintenance.

If any items are unclear or difficulties are encountered, please contact Vanmark Equipment for assistance.

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Vanmark, the company that developed the first commercial potato peeler, is a recognized leader in the manufacture of food processing equipment throughout the world. Since 1954, Vanmark Corporation has been designing and manufacturing food processing equipment to peel, scrub, wash, inspect, fry, store and handle many types of products in the food industry.

However, we also know a great deal about processing other root crops, such as carrots, beets and even onions. In fact, most of the carrots processed in the United States go through Vanmark peeler / washers before heading for the consumer.
Our equipment is also used to process a variety of other vegetables and fruits, such as cabbage and apples.

As we enter our second half-century in business, Vanmark is prepared to apply its innovative expertise in food processing to solving challenges for a wider range of applications.

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TABLE OF CONTENTS

Series 2420/2421 Peeler/Washer

1.0000 General Information
1.1000 Data Sheet
1.2000 Specifications
1.3000 Machine Description

2.0000 Installation Instructions
2.1000 Receiving and Positioning
2.2000 Utility Connections
2.2100 Electrical
2.2200 Water

3.0000 Operating Instructions
3.1000 Initial Start - Up
3.2000 Adjustments
3.2100 Roll Speed
3.2200 Discharge Gate Adjustment
3.2300 Roll Speed Adjustment
3.3000 Start-up
3.4000 Shut-down
3.5000 General Sanitation Practice

4.0000 Maintenance
4.1000 Routine Servicing
4.1100 Daily
4.1200 Weekly
4.1300 Monthly
4.1400 Annually
4.2000 Trouble Shooting
4.3000 Peeling Chamber & Rollers
4.3100 Peeling Roller Removal
4.3110 Splash Guard Removal
4.3200 Abrasive Rollers
4.3300 Sinewave Abrasive Rollers
4.3400 Brush Rollers
4.3500 Pintle Rollers.
4.3700 Locking Nut Assembly Instructions
4.4100 Drive Belt Replacement
4.4200 Replace Pulleys and Pulley Hub Bushings
4.4300 Drive Case Removal and Installation
4.4400 Drive Shaft and Roll Shaft Replacement
4.4500 Roller Drive Coupling
4.4600 Timing Roller Drive Couplings

TABLE OF CONTENTS

5.0000 Parts
5.1000 Peeling Rolls
5.2000 Mechanical Drive Case
5.3000 Reversing Rolls
5.4000 Batch Gate Discharge

6.0000 Spare Parts

7.0000 Charts and Schematics
7.1000 Peeling Roll Configuration - Six (6) Rolls
7.2000 Electrical Schematic
7.3000 Water Schematics
7.4000 Hz. To RPM Conversion Chart

8.0000 Component Bulletins
Movitrac LT E Inverter

9.0000 Warranty

1.1000 DATA SHEET

SERIES 2420/2421 PEELER/WASHER

Machine Number_____ Serial Number_____

Purchaser:

Name _____

Address _____

_____

_____

_____

Date Shipped: _____

Application _____

Selected Options:

_____ Drain Pan

_____ Reversing Roll

_____ Small Product Discharge Ring

_____ Inverter

_____ Batch Gate Discharge

PLEASE REFER TO THIS INFORMATION IN USING YOUR MANUAL. IN ANY COMMUNICATIONS TO VANMARK EQUIPMENT FOR PARTS OR SERVICE; USE THIS MODEL AND SERIAL NUMBER.

1.2000 SPECIFICATIONS

1.2100 SERIES 2420/2421 PEELER/WASHER

Equipment Specifications

Approximate Weight ..... (2420) 1500 Lbs.
..... (2421) 1300 Lbs.

Overall Dimensions

Length ..... (2420)110.00”/2794cm – (2421)74.75”/1900cm
Width ..... 28.00”/711cm
Height ..... 63.00”/1600cm
Discharge Height ..... 38.00”/965cm

Mechanical Rollers

Roll Speed ..... 150 – 450 RPM
Motor ..... (2420) 5 HP – (2421) 3 HP (optional voltages)

Spray Bar

Water Flow
@ 5 PSI ..... 10 GPM (37.80 Liter/Min)
@ 10 PSI ..... 14 GPM (53.00 Liter/Min)
@ 20 PSI ..... 20 GPM (75.71 Liter/Min)
@ 40 PSI ..... 27 GPM (102.2 Liter/min)
Water Connection ..... 1.00" (Nominal) MPT

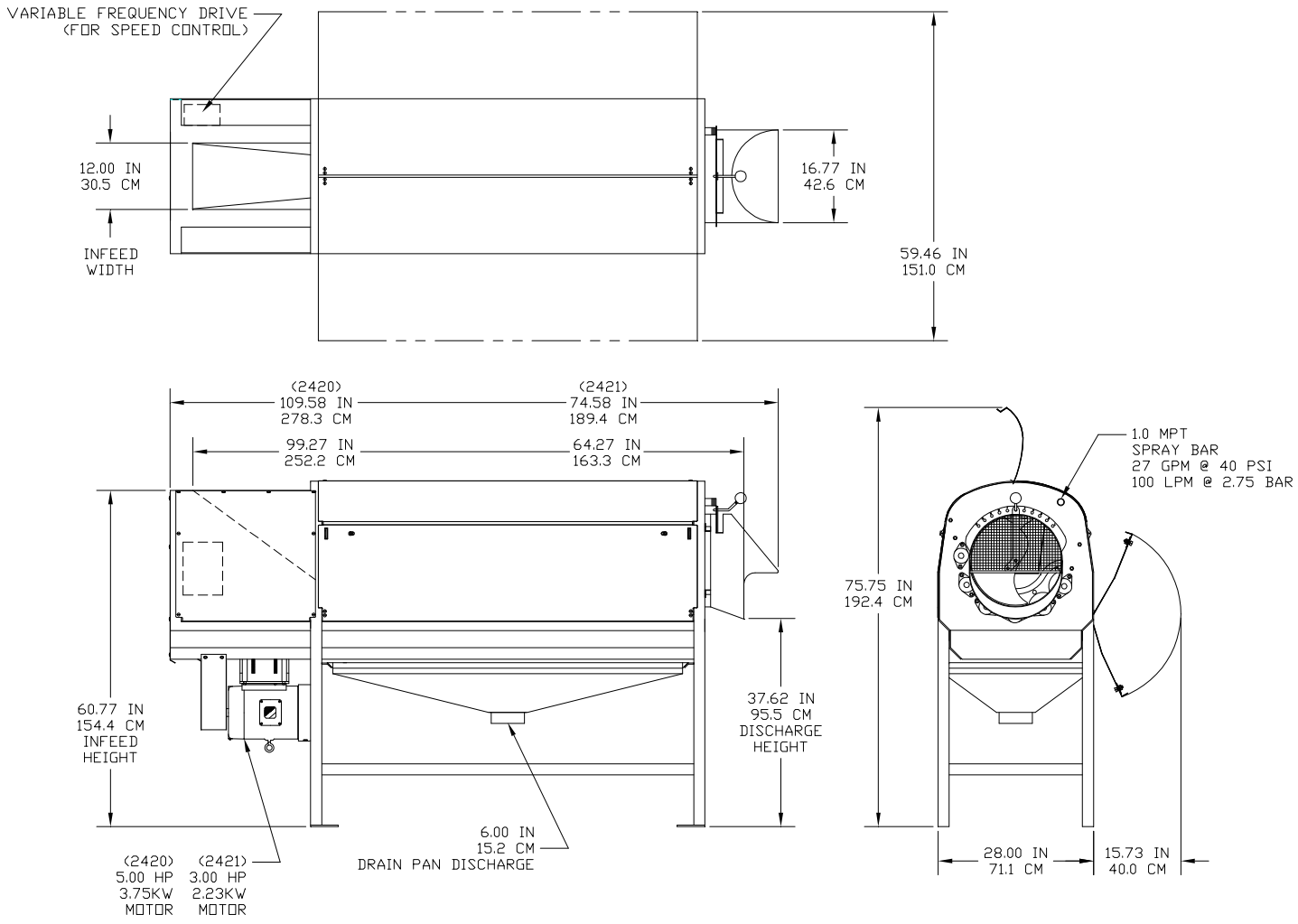
1.2200 LUBRICANTS

GREASE:

H1 lubricants - These may be used on food-processing equipment as a protective antirust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations where the lubricated part is potentially exposed to food. "H1" is a USDA authorized lubricant for applications which require a non-toxic, clean lubricant.

Typical physical requirements:

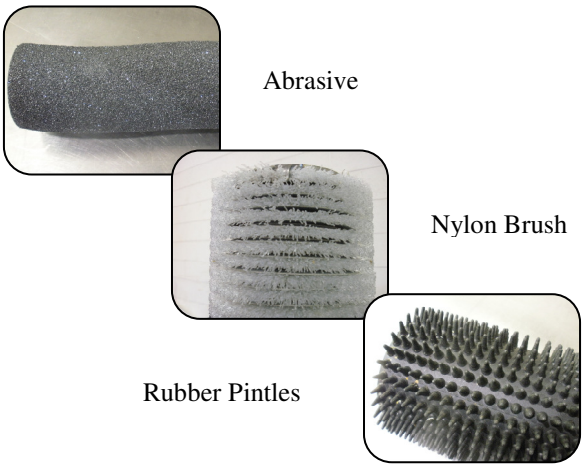
NLGI Grade Code	2
USDA Rating	H1
Work Penetration	375
Texture	Tacky
Dropping Point, °F (°C)	470 (243)
ASTM D-942 Oxidation; pressure drop in 100 hrs. PSIG	5.0 Max.
Color	Cream White
Operating Temperature	-30 - 370° F



Vanmark Peeler/Washers are designed and built to provide long years of service with minimal maintenance. The Series 2420 offers options which give it the versatility to ensure effective continuous peeling or washing to meet specific processing requirements. Model 2421 is offered with a batch style discharge gate.

The peelers are constructed of stainless steel making them easy to clean. High quality materials and components are used insuring long term operation with minimal maintenance.

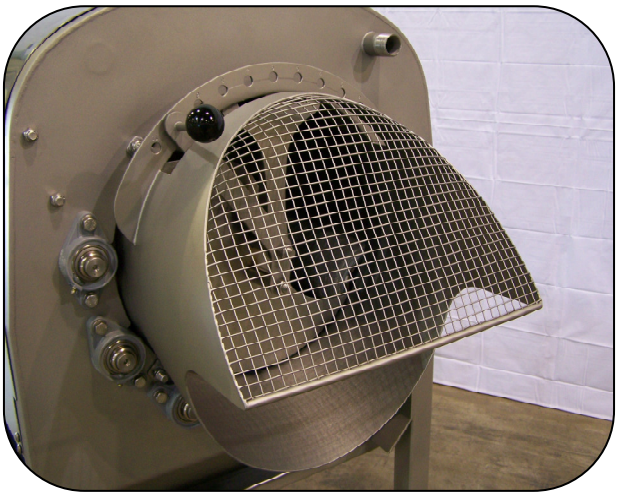
1.3000 MACHINE DESCRIPTION



The peeling chamber consists of six (6) rolls with three (3) types of surface coverings. Roller types include: Abrasive is many grit sizes, available in Sine - Wave, straight, agitator and lift rolls; Nylon Brushes with varied rigidity; and Rubber Pintles in straight, or sinewave.

The Sine-Wave double contoured rollers are designed to create a natural tumbling action for consistent peel removal. The Sine-Wave design helps prevent flat spots, even in regular shaped fruits vegetables. This means less waste and a clean finished product.

A centralized water wash system is located on the upper left side of the peeling chamber. The water spray bar with nozzles located along its length; provides a constant water spray through the product as it is being processed.



The product depth in the peeling bed is controlled at the discharge end of the machine with a gate controlling the effect of the rollers on the product.

The discharge gate is manually adjustable. To increase or decrease the discharge opening, the handle is moved until the desired position of the gate is reached.

2.1000 RECEIVING AND POSITIONING

Receiving and Positioning

- Inspect machine for shipping damage and make carrier claims immediately if necessary.

- Machine is shipped on skid that may be towed on level surface by end crossmember. Machine may also be carried on lift truck by extending forks under lowest horizontal tubing of frame. Center of gravity is approximately one-third of overall length from inlet end.

- NOTE: If drain pan of machine extends below lower horizontal braces, it may be necessary to remove drain pan when using a lift truck.

- If jib crane is used to move machine, use two (2) slings under lowest horizontal tubing of frame. Use spreaders on top of machine to reduce sling pressure against sides of machine.

- Remove four (4) bolts that go through foot pads of frame into skid and lift machine off of skid. Remove any hold-down straps or vertical bracing by cutting and discarding.

- Machine is to be located over a waste trench, or other means provided to dispose of water and product waste. Locate machine to allow for adequate clearances to other equipment, access to covers, removal of discharge gate or opening auger discharge, and ventilation at drive compartment.

- Machine doors must be clear of all obstacles:
  Two (2) peel chamber top
  Two (2) peel chamber side doors
  One (1) peel discharge gate

- Drive compartment panels to remain removable, free of plumbing and conduit mounts.

- Vanmark does not recommend drilling and taping holes in machine frame for mounting utilities, due to sanitation issues.

- Machine must be level for proper operation. Vanmark recommends checking level, on the bottom roller, inside the machine. Machine may have a fall of 0 – 1”/2.5cm in six (6) feet/1.83m toward discharge end.

- Anchor machine to the floor through the holes in hold down pads in the frame, if mounting machine on stand, or elevated framework, level machine as previously described and then anchor it by bolting or welding to stand.

- Check that all fasteners are tight.

2.2000 UTILITY CONNECTIONS

2.2001 Scope of Supply - Vanmark does not supply any material or labor for utility connections.

2.2002 Utility Requirements - See Specifications Section 1.2000 for utility requirements to size required components. See section 1.3000 for utility locations.

Utility Connections

Electrical

- All electrical connections shall be permanent water-tight and shall confirm to Local and National electrical codes.

- When routing cables, conduit, and water piping; do not interfere with access to machine covers and other moving and removable parts.

- Motor is to be connected to and controlled by inverter, for roll speed control. A 3 second ramp-up and ramp-down delay is recommended, while recommended frequency range is from 30 to 90 Hz. Motor and roll rotation is counter-clockwise, when viewed from the discharge end of machine.

Water

- Water to spray bar connection is made at 1.00" MPT located at discharge end of machine. Vanmark recommends installation of solenoid valve connected to main drive power and manual valve (spherical ball type) to control flow.

- Open ball valve full open to flush contaminates from new piping, check flow at nozzles, remove and clean if necessary. Set ball valve at minimum flow setting that provides full spray coverage of the peel chamber.

3.1000 INITIAL START-UP

3.1001 Lubrication – At the discharge end; check that bearings have grease and set screws are tight.

3.1002 Discharge Gate – Check that discharge gate is set to about half way.

3.1003 Loose Equipment - Check that all chutes or other loose items are in their proper place before powering up machine.

3.1004 Peeling Chamber - Check that peel chamber is clear of any loose items.

3.1005 Covers - Close and latch all covers and discharge gate

3.1006 Personnel - Check that all people are clear of machine.

3.1007 Power-Drive System - Turn on power.

3.1008 Motor Rotation - Check that shaft rotation of drive unit is clockwise when viewed from inlet end of machine.

3.1009 Peel Roll Rotation - When viewed from the discharge end of machine, the peeling rolls should turn counter-clockwise.

3.1010 Drive System – Set motor control for about 250 rpm for initial start up.

3.1011 Water - Turn on water to spray bar at machine or ahead of solenoid valve.

3.1012 Product Tests - Machine is now ready to run with product.

3.1013 Discharge Gate - Open the discharge gate manually until the product depth levels at a point needed to accomplish good peel removal or wash.

3.1014 End of Test - See Section 3.4000 for shut-down sequence of operation.

3.1015 Set Screws - Tighten set screws on bearings and sprockets.

3.1016 Daily Operation - Machine is now ready for production. See Section 3.3000 for start-up sequence of operation.

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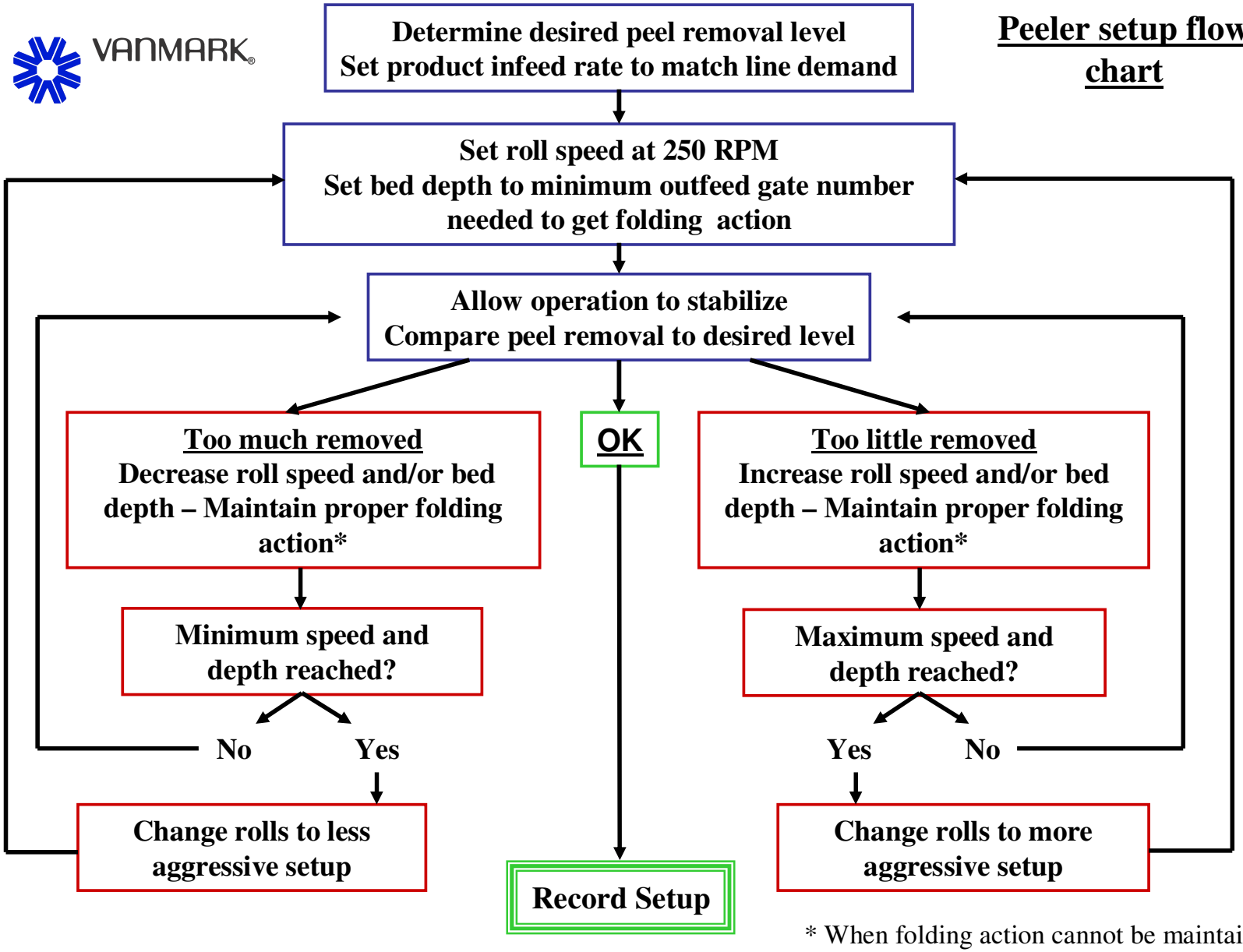
Peeler setup flow chart


Determine desired peel removal level
Set product infeed rate to match line demand
Set roll speed at 250 RPM
Set bed depth to minimum outfeed gate number needed to get folding action
Allow operation to stabilize
Compare peel removal to desired level
Too much removed
Decrease roll speed and/or bed depth – Maintain proper folding action*
OK
Too little removed
Increase roll speed and/or bed depth – Maintain proper folding action*
Minimum speed and depth reached?
Maximum speed and depth reached?
No
Yes
Yes
No
Change rolls to less aggressive setup
Record Setup
Change rolls to more aggressive setup

* When folding action cannot be maintained roll setup change is indicated

3.2000 ADJUSTMENTS

3.2001 Three major factors that affect continuous peeling efficiency are:

1. Effect of roller surface on product.
2. Amount of roller surface moving past product.
3. Retention time of product in peeling chamber.

Discharge Gate position will control product load level and retention time. Product load level will determine how much force is applied to the product on the roll surface and will effect tumbling action.

A good tumbling action will produce a more evenly peeled product. Retention time is how long the product is in contact with the rolls inside the machine. These adjustments work hand in hand with roll speed.

Roll speed is a very important factor in how well your peeler/washer performs. It is very easy to run the rolls at a higher rpm than required to achieve proper peeling/washing. Roll over speed will cause increased peel loss and product damage, and an inconsistent peel removal. After machine installation, take some time to determine proper bed depth and tumbling action with as little roll rpm as possible.

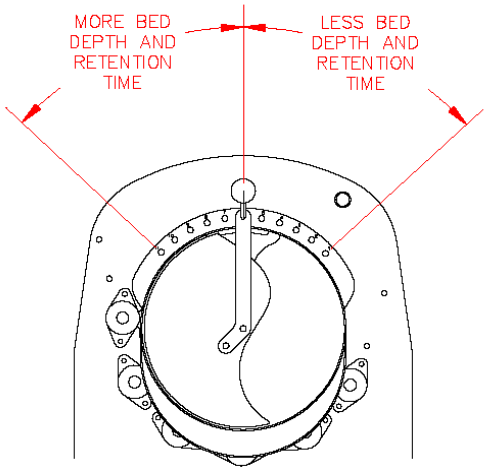
For best results, a steady inlet flow of product is necessary for consistent bed depth and peel removal.

3.2002 Adjustments are a judgment of the operator that is made by examining the product when it reaches the inspection table. Speed of rolls and discharge gate opening should compliment each other. Different products and product condition will determine ultimate machine setup.

Remember - - too much peel removal creates excess product loss. Proper adjustment is essential for efficient operation of machine.

3.2100 Roll speed on the 2420 Peeler/Washer is set with an electrical inverter. Electrical requirements for this machine can be found in section 1.2000. To find the exact Hertz output to roll RPM, a handheld tachometer could be used to set the roll RPM manually. For your convenience; a chart has been included in Section 7.4000

3.2200 DISCHARGE GATE ADJUSTMENT



To adjust discharge opening, move handle to rotate gate to desired location.

Note: Numbers on calibration plate are for reference in daily settings; they do not give any specific product volume discharging from the machine.

3.2300 ROLL SPEED CONTROL

Speed is controlled by inverter, mounted on left hand side at the rear of the machine. Display is shown in frequency (Hz), to convert to RPM, consult chart in Section 7.4000.

3.3000 START-UP

3.3001 Loose Equipment - Check that all chutes or peeler chamber panels are in their proper place.

3.3002 Discharge - Manually close the discharge gate.

3.3003 Covers - Close and latch all covers.

3.3004 Power - Turn on power to roller and tumbling unit, if so equipped, drive systems.

3.3005 Water: - Turn on water to spray bar ahead of solenoid valve.

3.3006 Drive System - Engage settings to low or middle range on the indicator.

NOTE: See Section 3.2000 Adjustments

3.3007 Filling Bed - Allow peeler/washer chamber to fill with a deep bed of product. Product fed to peeler should be controlled for even flow.

3.3008 Discharge Gate - Open the discharge gate manually until the product depth levels at a point needed to accomplish good peel removal or washing.

NOTE: See Section 3.200 Adjustments.

3.4000 SHUT-DOWN

3.4001 Product Flow - Stop product flow to machine.

3.4002 Empty Bed - Slow peeling rollers to minimum speed. Allow all product to discharge from bed.

3.4003 Cleaning - Wash down peeling chamber. Make sure that all product residue is removed from rolls.

IMPORTANT: During high pressure cleaning do not aim steam directly into drive compartment or onto bearings.

3.4004 Power - Shut off electric power to drives and spray bar water solenoid.

3.4005 Covers - Close all covers.

3.4006 Clean exterior of machine - High pressure spray or a cleaning solution used with a cloth, is recommended.

IMPORTANT: During high pressure cleaning do not aim steam directly into drive compartment or onto bearings.

3.5000 GENERAL SANITATION PRACTICE

Vanmark's equipment and parts have been designed and made of such materials and workmanship that make them adequately cleanable when properly maintained. It is at the equipment user's discretion to determine the appropriate level of sanitation required for each machine's specific application and location within a given facility. This should be done by the user to maintain compliance, and consistency with each company's own sanitation standards. The rolls that act on product are designed for ease of removal from the machine, and disassembly. If the cavity formed by a hollow roll tube requires access for cleaning, the roll must be removed from the machine and disassembled (reference section 4.3000).

4.1000 ROUTINE SERVICING

Your Vanmark Peeler/Washer is designed and constructed for efficient operation, but it does require service and maintenance. A major breakdown can be expensive. Therefore, it is economical to follow this routine servicing program to assure that problems can be detected and corrected.

Service schedule is estimated based on eight (8) hours of production per day, five (5) days per week under normal operating conditions. Schedule may require adjustments if production time and operating conditions are different.

4.1100 Daily

- Clean peeling chamber.
- Check condition of peeling rolls.
- Check for clogged nozzles on spray bar.
- Check for line up-time (maximum number of shut-offs not to exceed three (3) times per hour with 85 - 90% line up-time).
- Check for belt stretching and excessive wear.

4.1200 Weekly

- Check for loose or binding hardware.
- Check bearings for wear.
- Clean abrasive rolls with diluted muriatic acid. Let stand approximately two (2) hours (vary time with amount of starch and peel build up). Scrub abrasive surface with stiff brush and rinse thoroughly. Personnel should wear personal protective equipment as recommended by cleaning agent manufacturer or employer.
- Check all belts for stretching and excessive wear.
- Adjust drive belt if required

4.1300 Monthly

- Tighten set screws in bearings and bushings.
- Inspect roller bearing for tight fit.

4.1400 Annually

- Inspect and replace any belt with excessive wear.
- Inspect and replace each roller bearing.

4.2000 TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Poor Peel Removal	Tumbling (mixing) action in peeling chamber is slow	Increase roller speed - See Section 3.2200 Replace worn rollers
	Too much product in peeling chamber	Adjust discharge gate - See Section 3.2100 Maintain even infeed
	Poor line up-time	Control product flow evenly - See Section 3.2001
	Abrasive rollers have starch build-up or are worn	Clean or replace
	Not enough water	Check spray bar nozzles for clogging and adjust water flow
	Brush rollers are worn	Replace
	Brushes installed backwards	Reverse rolls end for end
	Sequence and type of rollers is not effective with product	Contact Vanmark for recommendation
	Roller rotation is counter-clockwise at discharge end	Change electric motor rotation
Product loss from peeling chamber	Roller surfaces worn	Replace
	Splash guards improperly aligned	Realign by lifting the masking over roll and adjusting the splash guard bolts
Not all rollers turning	Belt loose or broken	Repair or replace
Rollers run unevenly	Discharge gate obstructed	Remove obstruction by opening discharge gate. Reset to desired setting
Rollers not turning	Product or foreign item jammed in bed	Turn off power to peeler. Remove obstruction. Restart

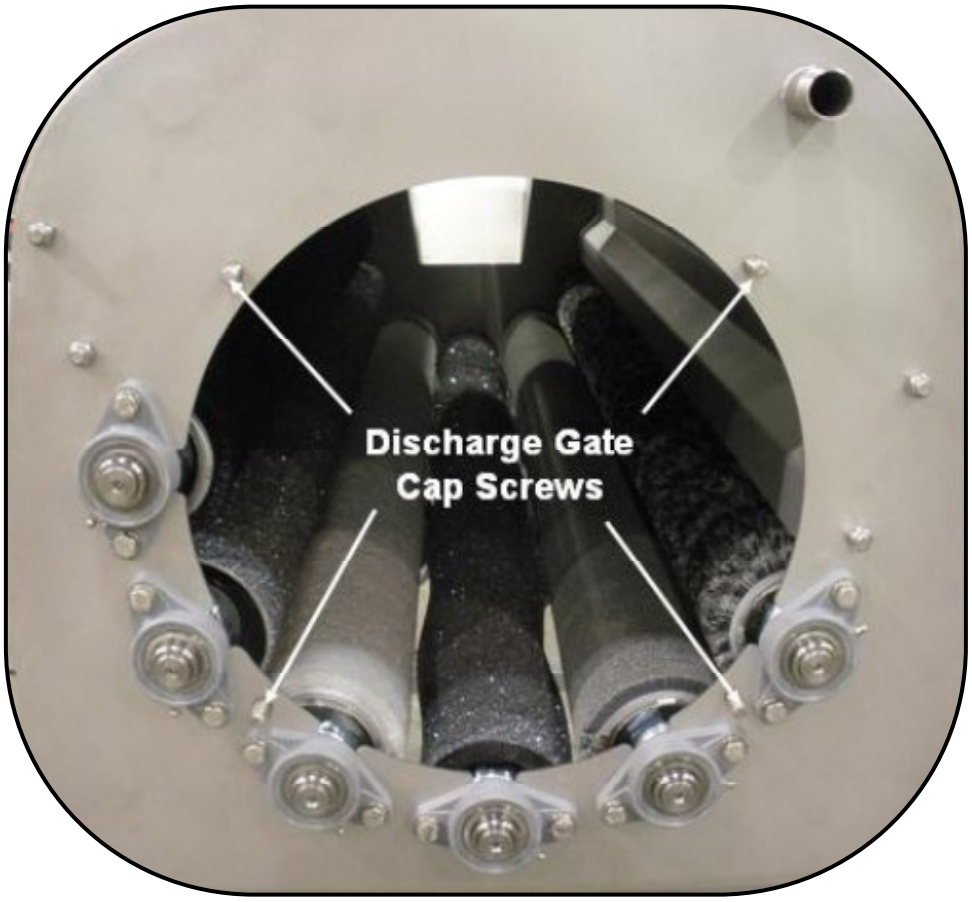
4.2000 TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Rollers run clockwise at discharge end	Drive motor rotation is counterclockwise	Change motor rotation
Electric drive or tumbling unit motors do not run	Power is off	Turn on power
	Wiring loose or disconnected at motor or motor starter	Check wiring
	Motor defective	Replace motor
	Breaker off or tripped	Reset breaker. Turn off power to peeler. Check peeler bed, tumbler, drive case, belts, etc. for obstruction that may have caused breaker to trip. Reset breaker, turn on peeler. If breaker continues to trip, check for proper breaker size, based on motor amp draw.
Roller drive motor runs, rollers do not	Belts or pulleys worn, misaligned, broken or loose	Replace and adjust
No water to spray bar	Manual valve closed	Open valve
	Nozzles on spray bar clogged	Clean
	Solenoid defective or incorrectly wired	Replace solenoid
	Drive motor is off	Turn on motor

4.3000 PEELING CHAMBER AND ROLLERS

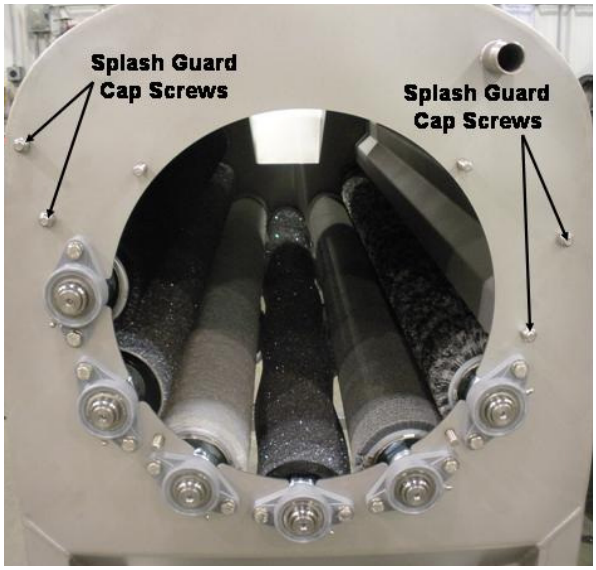
4.3100 Peeling Roller Removal - Removal is required to change shaft arrangement, replace roller bearings or when work is required to drive compartment. This could include drive coupling replacement, or replacing belts, shafts and bearings in drive case. To work on roller related drive components with rollers still in machine is nearly impossible.

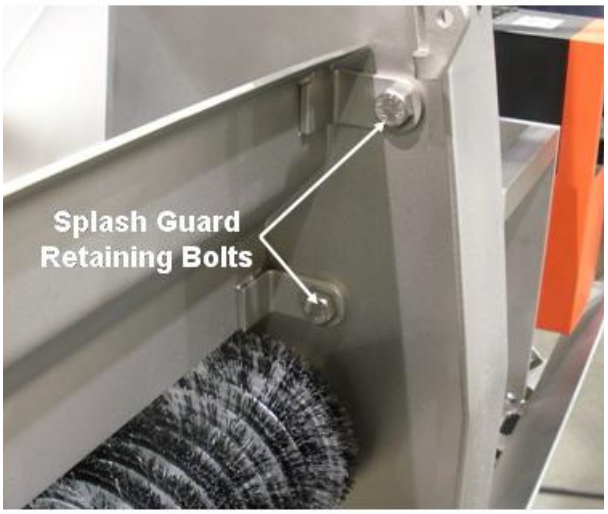
4.3105 Expose the peeling rolls by unlatching peel chamber side covers and rotating down to full open position. Open top cover to full open position. Next, remove four (4) cap screws holding discharge gate, remove gate and set aside.



4.3110 Splash Guard Removal - Splash Guard removal is not necessary to remove the rollers, however, it is more convenient to remove them before work is started on roller removal.

4.3000 PEELING CHAMBER AND ROLLERS





1. Remove retaining bolts that attach splash guard to discharge plate at discharge end of machine, and remove retaining bolts at infeed plate of machine.

<u>Do not operate machine without splash guards in place.</u>

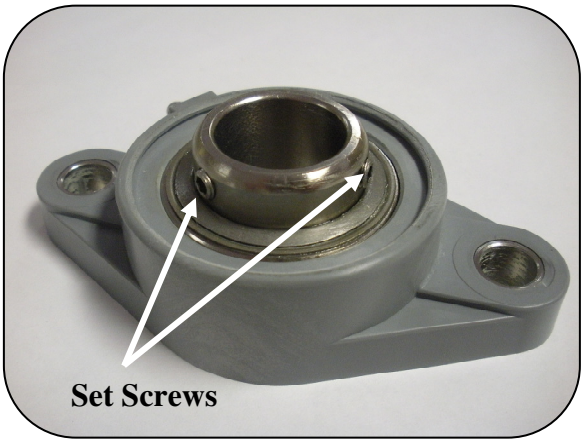
4.3115 <u>Identifying Peeling Rollers</u>

1. Six (6) Roller Units: Before removing any roller shafts, identify the kind, and position of roller by numbering them from 1 through 6. Rollers must be reassembled in the same position as they were originally removed.

Ref: Section 7.1000 Peeling Roll Configuration

4.3000 PEELING CHAMBER AND ROLLERS

4.3120 Removing Peeling Roller



1. Loosen two (2) set screws on bearing collar. Unbolt bearing, and remove. From side of machine, support shaft with both hands, lift discharge end of roll high enough so roller will clear end plate. At the same time, apply lateral pressure together with a slight twisting (rocking) motion to help release inlet (drive end) from drive coupler. Remove the shaft from machine. Repeat procedure for each remaining roller.

4.3125 Reassembly of Peeling Rollers

1. Clean bearing components.

IMPORTANT: *Food grade anti-seize is applied at the factory to all bearing bores, bearing shaft, and cap screw threads in this assembly at the time of assembly. It is strongly recommended that this procedure be followed to prevent seizure of any components.*

2. To reassemble, reverse procedure. Rollers should be replaced in No. 3 and 4 positions first, working outward to each side. See section 5.100 for roller component list. Install rollers in pairs noting the following:

   A. Consult machine notes relating to original roller arrangement.

   B. Two (2) set screws in bearing should be loose to allow bearing to slide on shaft.

3. Guide square end of roller shaft into drive coupling until end of shaft "bottoms out". Do not use force – firm hand pressure is sufficient.

4. Slide bearing on shaft, bolt bearing to discharge plate with bolts that were removed, making sure to use food grade anti-seize to prevent seizure.

5. With shaft still "bottomed out" against drive coupling, tighten two (2) socket head (Allen type) set screws on each bearing.

6. Re-install splash guards and close all machine covers before re-starting machine and checking roller action.

2” Aluminum Socket

1 3/8-6 Locking Nut

4.3200 Abrasive Rollers

Disassembly

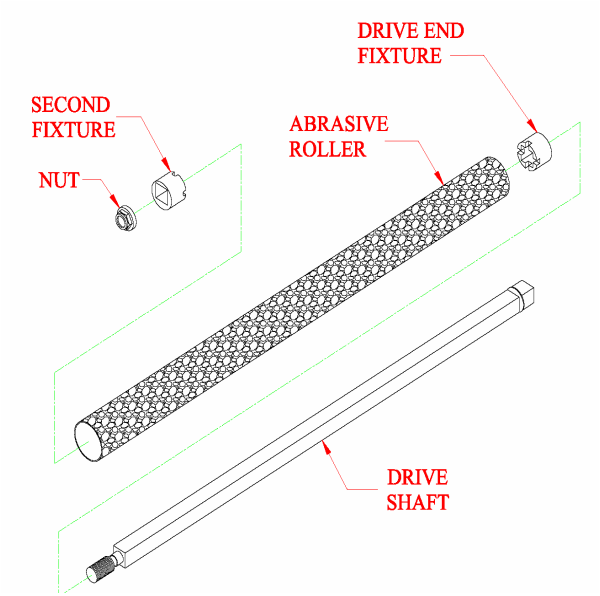
1. Remove 1 3/8 - 6 locking nut with 2” aluminum socket provided with machine.

2. Remove shaft from assembly by pulling out from drive (square) end.

3. Remove polyurethane fixture from each end of roller.

4. Clean all components thoroughly and inspect for abnormal wear or damage. If questionable, replace now.

NOTE: Vanmark will recondition abrasive rollers. Worn rollers are thoroughly cleaned and a new coat of abrasive added.



Reassembly

1. Install polyurethane fixture on drive end of roller. Check that roller drive lugs are nested in fixture recess.

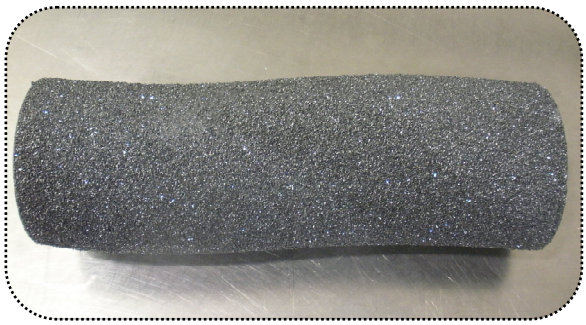
NOTE: For rollers having more than one grade of abrasive "grit", use the larger (coarsest) abrasive on the drive end. This end is mounted at the inlet or drive end of machine; also rollers that have notches go toward drive end.

2. Install shaft through fixture and roller. Care should be taken to not damage threads on bearing shaft by striking roller tube lugs.

3. Slide second polyurethane fixture over bearing end of drive shaft. Elevate shaft to center of roller. Align polyurethane fixture recesses with roller lugs and push fixture "home".

4. Install the 1 3/8–6 locking nut. Before tightening nut securely, center polyurethane fixture in roller for smooth operation. **DO NOT** over tighten as damage to segments can occur. See section 4.3700 for locking nut assembly instructions

SINEWAVE ROLLER



4.3300 Sinewave Abrasive Rollers

Disassembly

1. Remove 1 3/8-6 locking nut with 2" aluminum socket provided with machine.

2. Place board of suitable size on floor. With bearing (threaded) end facing down, strike board with entire roller assembly. This should loosen segments from shaft. Repeat procedure if segments do not come loose the first time.

NOTE: Do **NOT** strike bearing shaft on bare floor or with hammer. Resulting damage might require dressing down or replacement.

3. Remove segments from bearing end of shaft. Stop washer prevents removal from drive (square) end.

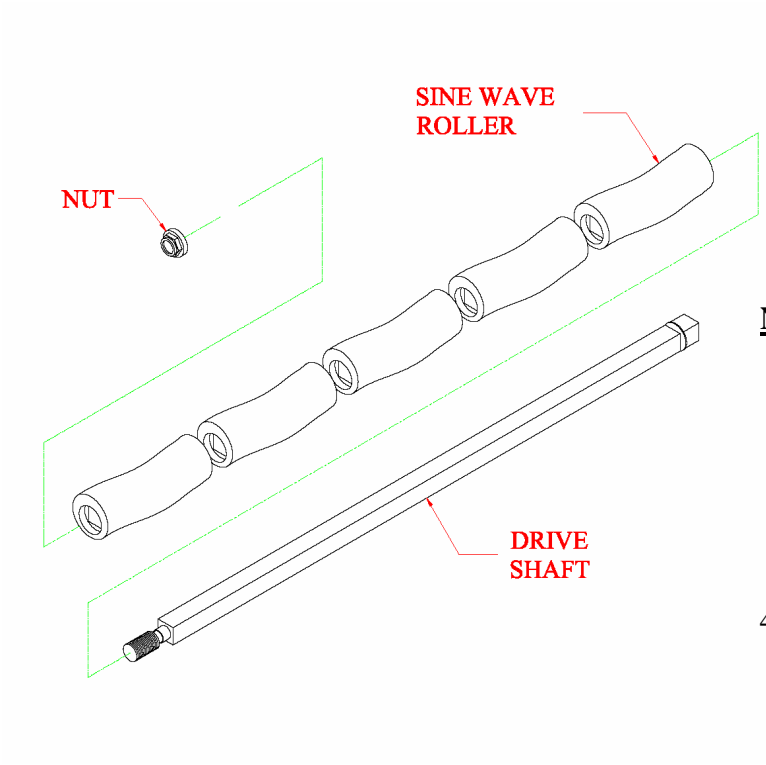
4. Clean all components thoroughly and inspect for abnormal wear or damage. If questionable replace now.

NOTE: Vanmark will recondition abrasive rollers. Worn segments are thoroughly cleaned and new coat of abrasive added. If chunks of the rubber core are missing, replace that segment.

Reassembly

1. Stand abrasive segments on end so that stamped word (either right or left) is facing up. If more than one grade of abrasive segment is installed on same shaft, large (coarsest) grit segments ordinarily go next to the drive (square) end of shaft and are put on first.

2. Rest drive end of shaft on floor and support the bearing end. Place segments on shaft with the stamped word towards you. Slide it toward drive end until the stop washer is seated in recess of segment.



3. Repeat the procedure to install the remaining four (4) segments. Always keep the stamped word towards you and in direct line with the word on the segment previously installed. DO NOT install right and left segments on same shaft.

NOTE: Segment can be determined right or left handed by looking along its length from either end. If helix or "high" part of wind curves to your left, it is left hand; if it curves to the right, it is right hand.

4. Install 1 3/8-6 locking nut and tighten securely. Segments must not appear to be loose on shaft; however, **DO NOT** over tighten as damage to segments can occur. See section 4.3700 for lock nut assembly instructions.

Brush Roller

4.3400 Brush Rollers

Disassembly

1. Remove 1 3/8-6 locking nut with 2" aluminum socket provided with machine.

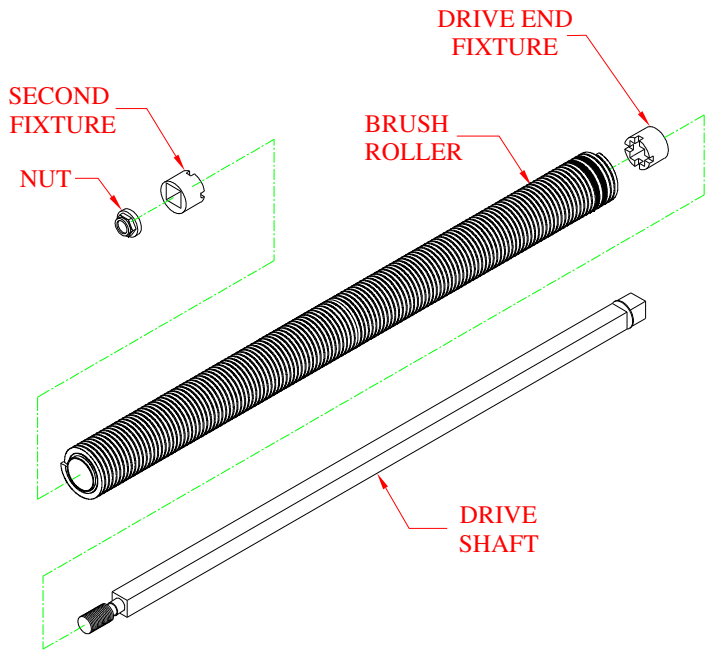
2. Remove shaft from brush roller assembly by pulling out from drive (square) end.

3. Remove polyurethane fixture from each end of roller.

4. Clean all components thoroughly and inspect for abnormal wear or damage. If questionable, replace now.

Reassembly

Brush rollers can not be reconditioned. They must be replaced when worn. Black band of bristles, at one end of new brush, identifies drive end. Bristles are slanted five (5) degrees in direct relationship to the wrap of the bristles on the tube.



1. Install polyurethane fixture in drive (black bristled) end of brush. Check that roller drive lugs are nested in fixture recesses.

2. Install shaft through fixture and brush roller. Care should be taken not to damage threads on bearing shaft by striking lugs on brush tube.

3. Slide second polyurethane fixture over bearing end of drive shaft. Elevate shaft to center of roller. Align polyurethane fixture recesses with roller lugs and push fixture "home".

4. Install 1 3/8-6 locking nut. Before tightening nut securely, center polyurethane fixture in roller for smoother operation.

See section 4.3700 for lock nut assembly instructions.

4.3450 Two Piece Brush Assembly

Disassembly

1. Remove 1 3/8-6 locking nut with 2" aluminum socket provided with machine.

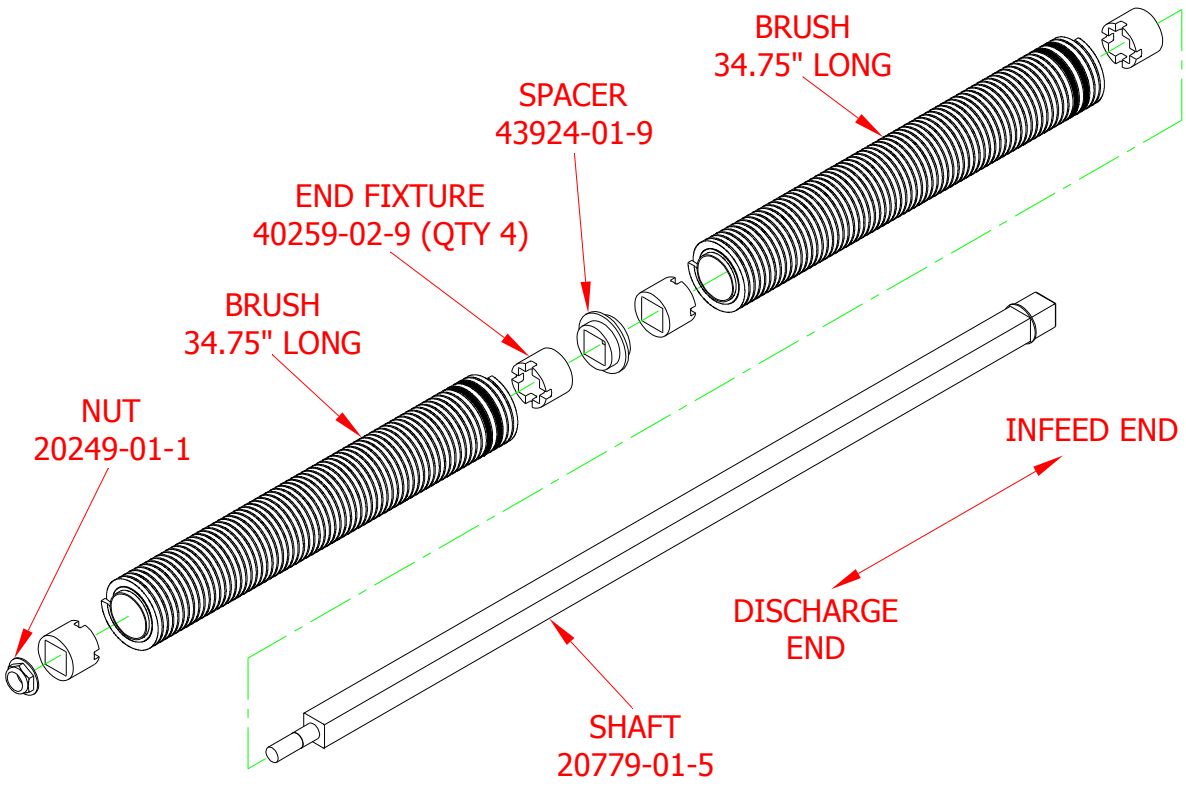
2. Remove shaft from brush roller assembly by pulling out from drive (square) end.

3. Remove polyurethane fixture from each end of brush, and spacer between both brushes.

4. Clean all components thoroughly and inspect for abnormal wear or damage. If questionable, replace now.

Reassembly

Brush rollers can not be reconditioned. They must be replaced when worn. Contrasting band of bristles, at one end of new brush, identifies drive end. Bristles are slanted five (5) degrees in direct relationship to the wrap of the bristles on the tube.



4.3000 PEELING CHAMBER AND ROLLERS

1. Install polyurethane fixture in drive (banded) end of brush. Check that roller drive lugs are nested in fixture recesses.

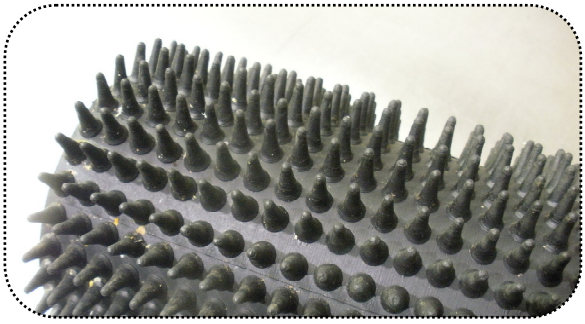
2. Install shaft through fixture and brush roller. Care should be taken not to damage threads on bearing shaft by striking lugs on brush tube.

3. Slide second polyurethane fixture over bearing end of drive shaft. Elevate shaft to center of roller. Align polyurethane fixture recesses with roller lugs and push fixture "home".

4. Install polyurethane spacer (43294-01-9), and then add another end fixture, brush, and then the final end fixture.

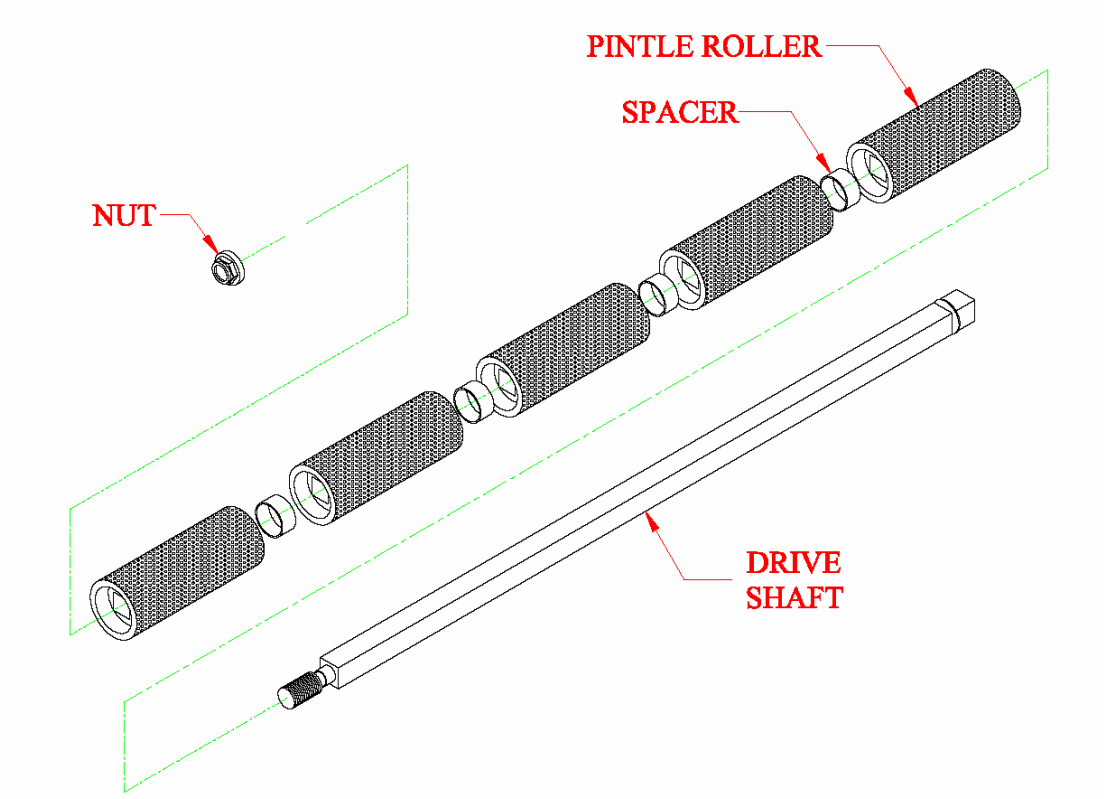
5. Install 1 3/8-6 locking nut. Before tightening nut securely, center polyurethane fixture in roller for smoother operation. **DO NOT** over tighten as damage to segments can occur. See section 4.3700 for locking nut installation instructions.

Pintle Roller

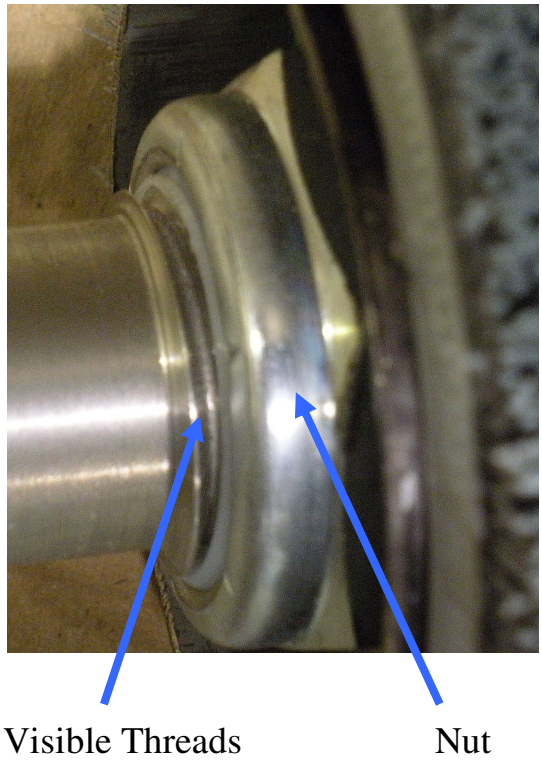


4.3500 Pintle Rollers:

Use disassembly and assembly instructions for sinewave abrasive rollers. Disregard reconditioning statement in disassembly instructions. Straight segments do not require timing. Remember to install spacers between each pintle segment. DO NOT over tighten as damage to segments can occur. See section 4.3700 for locking nut installation instructions.



4.3700 Lock Nut Assembly Instructions



- **Picture to the left shows ideal nut position on finished assembly.**
- **There should be 1 to 2 full threads visible beyond the nut.**
- **Minimum torque required to achieve nut position should not be less than 35 ft-lb.**
- **New nut is required if 3 or more threads are visible by applying less that 35 ft-lb.**
- **Tightening nut to 4 or more visible threads will cause product damage, product loss at discharge end of peeler, damage to infeed end wall plate and brush at infeed end.**

4.4100 Drive Belt Replacement

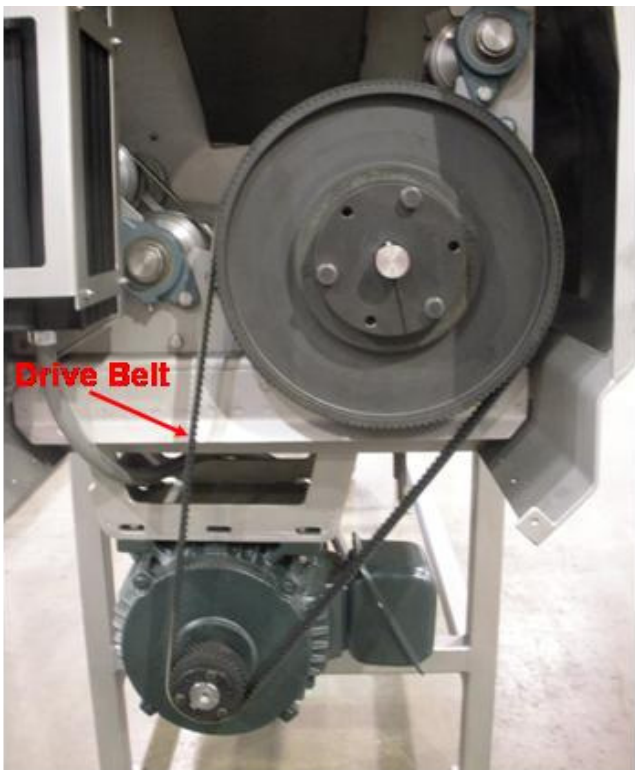
1. SHUTOFF AND LOCKOUT ELECTRIC POWER to prevent accidental starting.

2. Remove drive compartment inlet panel on inlet end of machine.

3. Remove four (4) 1/4” screw that retain drive belt cover, remove cover.

4. Loosen belt tension at motor mount.

5. Replace belt, then reverse procedure.



Shown with belt guard removed.

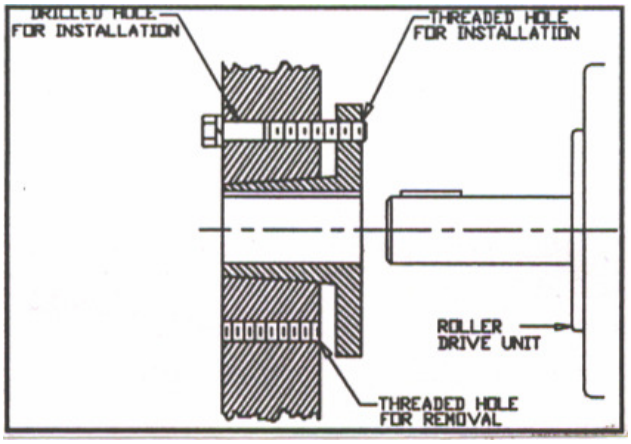
4.4200 Replace Pulleys and Pulley Hub Bushings

Disassembly

1. SHUT-OFF AND LOCK-OUT ELECTRICAL POWER to prevent accidental starting.

2. Remove inlet panel, and belt cover as described in Section 4.4100.

3. Remove belt as described in Section 4.4100.



4. Loosen and remove cap screws in bushing.

5. Insert cap screws in tapped removal holes and progressively tighten each one until pulley is loose on bushing.

6. Remove pulley from bushing.

7. Remove bushing from shaft.

Reassembly

1. Thoroughly inspect bore of mating part and tapered surface of bushing. Any paint, dirt, oil, or grease must be removed.

NOTE: Do not use lubricants.

2. Insert bushing into pulley,

3. Loosely insert cap screws into bushing and pulley.

4. With key in key seat of shaft, slide assembly onto shaft. If it is difficult to slide bushing onto shaft, wedge screwdriver blade into saw cut to overcome tightness.

5. Position the assembly on shaft so belt will be in alignment when installed. To align, place a straightedge against the outside edge of pulleys. Move pulleys until the straightedge touches two (2) outside and two (2) inside edges of pulleys. (Align pulleys, and install on shaft as near bearings on drive case as possible.)

6. Tighten cap screws evenly and progressively until obtaining correct torque. There must be a gap between bushing flange and mating hub when installation is complete.

7. Replace drive belt as described in Section 4.4100 and replace covers.

4.4000 DRIVE - MECHANICAL

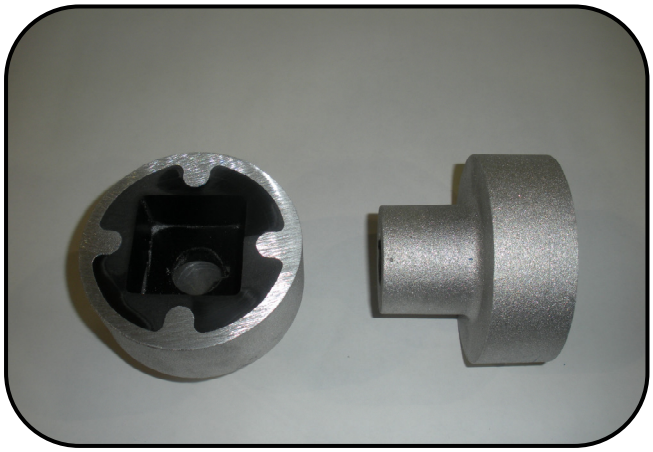
4.4300 Mechanical Roller Drive Case – Repair of components is possible without removal of entire drive case unit from the machine. Major repair is more easily accomplished with entire unit removed from machine. See section 5.2000 for parts.

4.4305 Drive Case Removal and Installation

1. Shut off and lock out electrical power to prevent accidental starting.
2. Remove all peeling rollers, see section 4.3100
3. Remove Drive compartment panels from right and left sides as well as infeed panel, by removing ¼" screws with screwdriver.
4. Remove four (4) 1/4" screws that retain drive belt cover, remove cover.
5. Loosen belt tension at motor mount and remove drive belt.
6. Remove four (4) 3/4" bolts that hold the drive case to the drive mount.
7. Use a lifting device to lift drive case off of mount and slide it out the right hand side of machine.
8. To install, reverse procedure.

4.4400 Drive shaft and Roll shaft replacement – Design of drive case makes it necessary to remove outer most shafts first, then on down until required shaft or belt is reached. Drive case dimensions and part identification can be found in section 5.2000.

Roller Drive Coupling



4.4500 Roller Drive Coupling - Drive coupling provides support for drive end of each roller and connection between power source and the peeling bed rollers. No maintenance or adjustment is required for day-to-day operation. Visual inspection on a regular basis should be made for cracks in the casting, loose or missing set screws and looseness of the coupling on its drive shaft. When any peeling rollers are removed from machine, careful inspection of urethane mold should be made. Check for square opening to be excessively worn (or egg shaped), softness of urethane mold, and that the urethane is firmly adhered to casting. Replace coupling if any one of these conditions are found. Drive couplings are bored to a very close tolerance. Couplings are installed on the shaft through a heat-shrink process.

WARNING: DO NOT:

A. Increase bore diameter of coupling.
B. Decrease (dress down) overall size of output shaft.
C. Overheat casting to point of melting, or modify urethane mold.
D. Use undue force when mounting coupling.

Disassembly

1. Shutoff and lockout power.

2. Remove rollers from peeler as described in Section 4.3000

3. Remove the main drive belt, as described in Section 4.4100

4.4500 Roller Drive Coupling – Disassembly – continued

4. Remove bolts (4) holding the drive case to the peeler frame, as described in Section 4.4305.

5. Loosen the set screw in the drive coupling being replaced. Remove coupling from shaft using a gear puller, if required.

Reassembly

1. Check key in output shaft keyway for nicks. Replace if necessary.

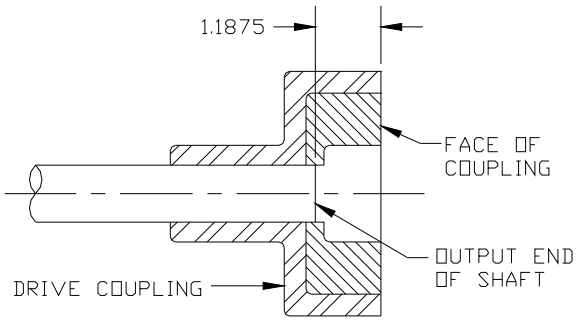
2. Clean any foreign material from surface of output shaft. Do not reduce overall diameter of shaft.

3. Remove any nicks or burrs from bore and keyway of coupling. Do not enlarge inside bore diameter.

4. Remove set screws from coupling.

5. Place coupling on work area with urethane down. Apply heat with torch for a few moments to external part of bore. DO NOT overheat. Rotate coupling to distribute heat evenly.

WARNING: ***Always wear appropriate eye protection. Use heavy gloves as aluminum couplings become too hot to handle with bare hands.***



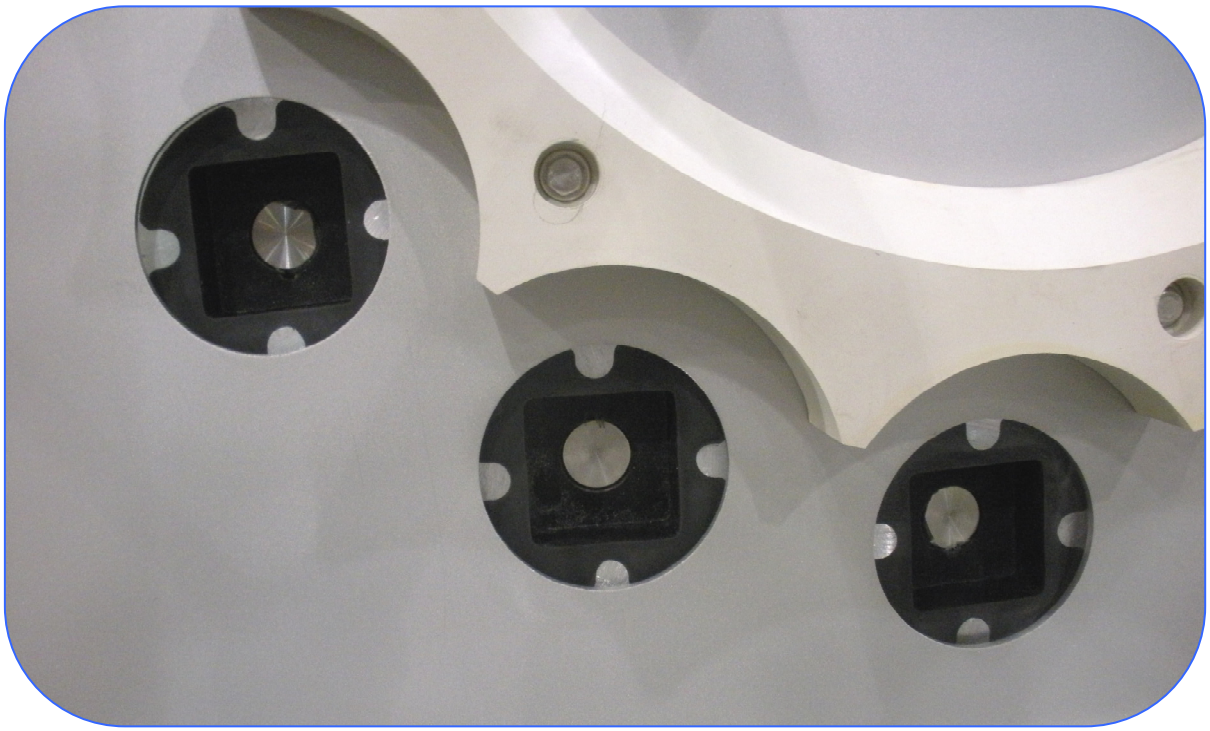
6. Align keyways of shaft and coupling. Push the heated coupling on shaft and bottom out against step on shaft. Correctly heating casting and speed in installing will allow coupling to "slip" onto its mating shaft quite easily. Immerse coupling in coolant immediately after installation to preserve urethane and its bond to casting.

7. To install, reverse procedure, making sure to time drive rollers.

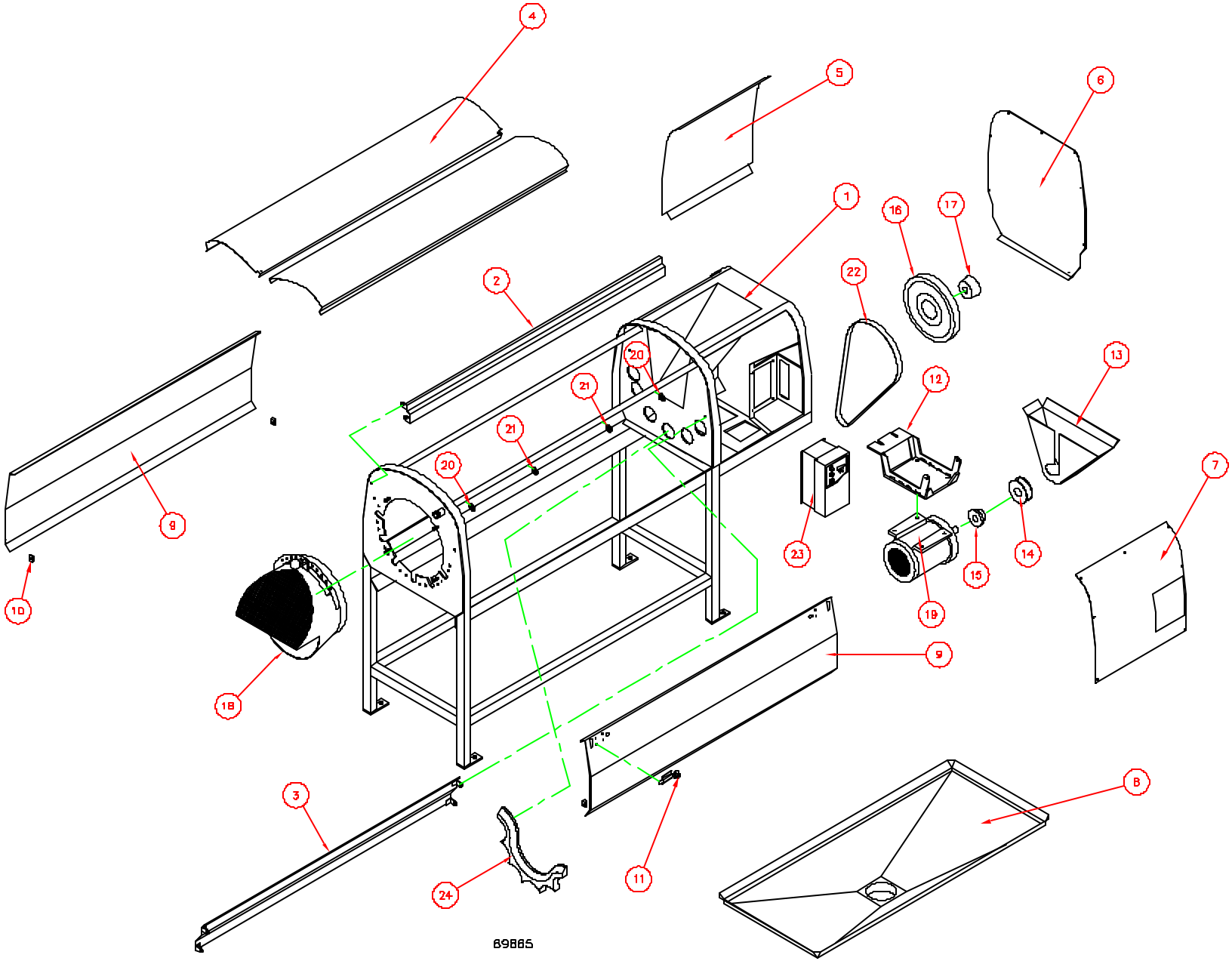
4.4600 Timing Drive Roller - Timing or coordinated rotation of rollers is only needed in machines using sinewave abrasive rollers.

1. To time sinewave abrasive rollers, rotate mechanical drive case so that the sides of the square openings in couplings are in a horizontal and vertical position.

2. Install abrasive rollers into drive case checking that word “left” or “right” on segment closest to bearing is in the same position. Position of the word on the first shaft installed is unimportant, but keeping all the words of succeeding rollers in same position as the first is of highest importance.



5.0000 Maintenance Parts

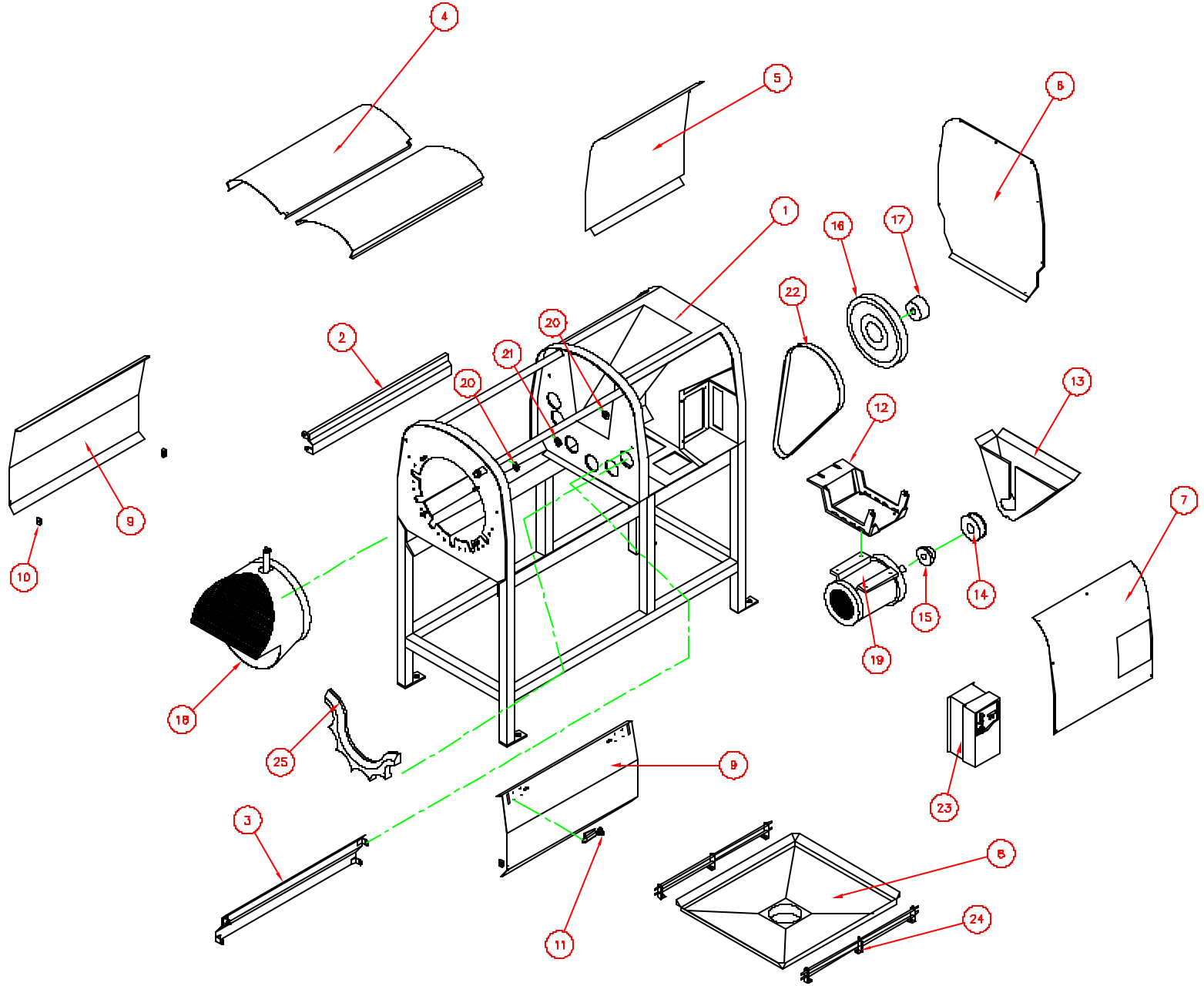


5.0000 Maintenance Parts

2420 Peeler/Washer

Ref. No.	Part Number	No. Req.	Description
1	25628-01-5	1	Frame, 2420 Peeler
2	25640-01-5	1	Splash Guard, 02420 R.H.
3	25639-01-5	1	Splash Guard, 02420 L.H.
4	43812-01-5	1	Cover, Peel Chamber Top, 02420
	59341-03-5	1	Inspection Door, 2421 Peel Chamber
5	39107-01-5	1	Panel, R.H. Drive Side
6	39106-01-5	1	Panel, Inlet End, 02420
7	25657-01-5	1	Panel, L.H. Drive Side W/ Inverter Door
7	39109-01-5	1	Panel, L.H. Drive Side
8	25636-01-5	1	Drain Pan, 02420
9	39104-01-5	2	Panel, Lower Peel Chamber
10	38818-01-9	8	Hinge, Door
11	39000-01-5	4	Latch, Peel Chamber Door
12	25646-01-5	1	Pivot Plate, 02420, 215T
13	25650-01-5	1	Cover, Drive Belt, 02420
14	43794-03-9	1	SPRKT, Eagle PD, 36T
15	40957-01-1	1	Bushing, QD, #SH, 1.38B
16	43794-04-9	1	SPRKT, Eagle PD, 140T
17	42294-08-1	1	Bushing, QD, #E, 1.25B
18	25648-01-5	1	Chute, 02420 Discharge Gate
19	40318-xx-9	1	Motor, 5HP (Voltage Optional)
20	42477-02-9	2	Nozzle, Vee Jet
21	42195-03-9	2	Nozzle, Full Jet
22	43793-02-9	1	Belt, Eagle PD
23	42807-27-9	1	Inverter, 5 HP
24	43808-01-9	1	Product Protector, Inlet End
	59350-01-9		Small Product Ring

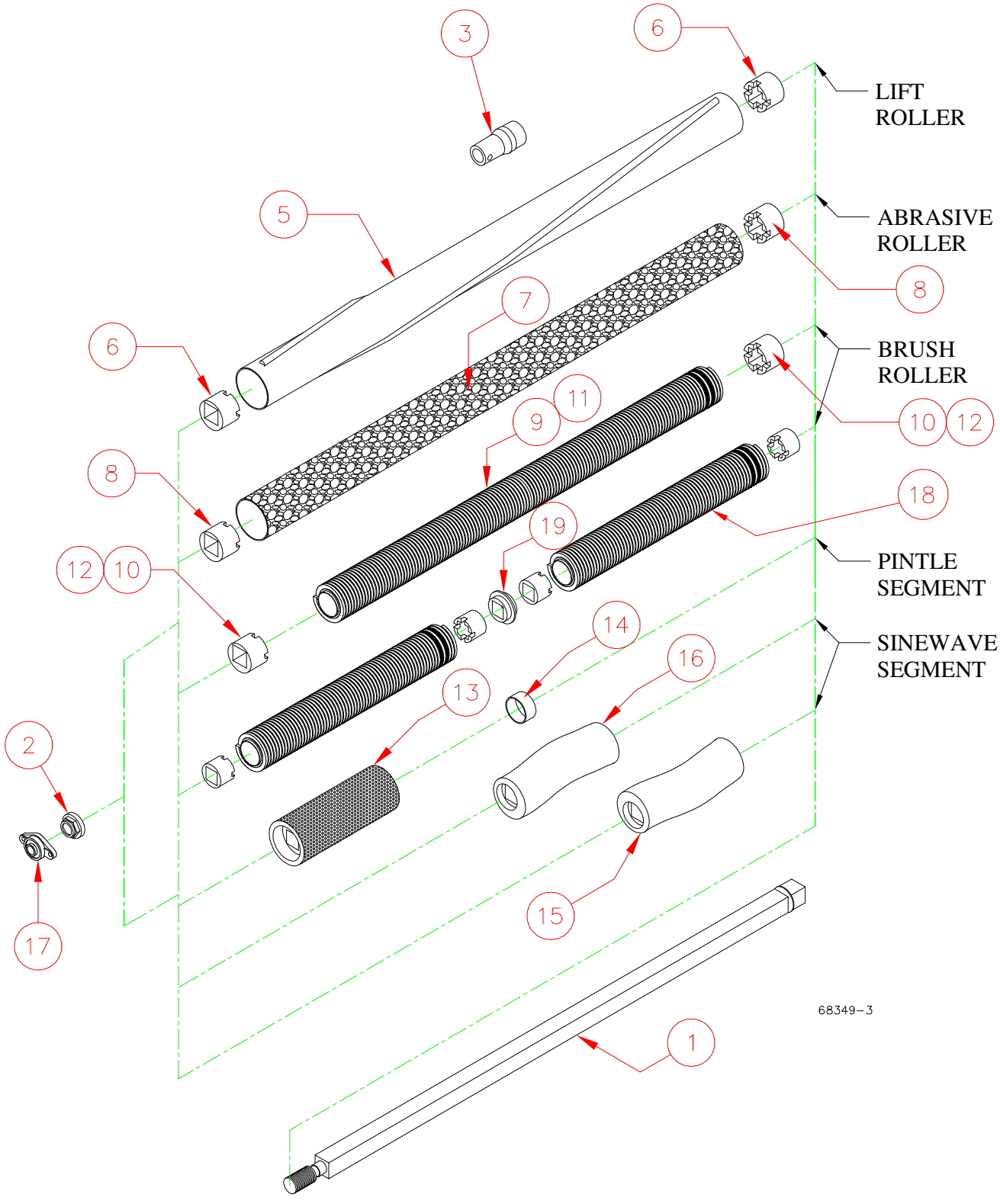
5.0000 Maintenance Parts



2421 Peeler/Washer

Ref. No.	Part Number	No. Req.	Description
1	26063-01-5	1	Frame, 2421 Peeler
2	25640-02-5	1	Splash Guard, 02420 R.H.
3	25639-02-5	1	Splash Guard, 02420 L.H.
4	43994-01-5	1	Cover, Peel Chamber Top, 02421
	59341-06-5	1	Inspection Door, 2421 Peel Chamber
5	39107-01-5	1	Panel, R.H. Drive Side
6	39106-01-5	1	Panel, Inlet End, 02420
7	25657-01-5	1	Panel, L.H. Drive Side W/ Inverter Door
7	39109-01-5	1	Panel, L.H. Drive Side
8	26065-01-5	1	Drain Pan, 02421
9	39104-01-5	2	Panel, Lower Peel Chamber
10	38818-01-9	8	Hinge, Door
11	39000-01-5	4	Latch, Peel Chamber Door
12	25646-01-5	1	Pivot Plate, 02420, 215T
13	25650-01-5	1	Cover, Drive Belt, 02420
14	43794-03-9	1	SPRKT, Eagle PD, 36T
15	40957-01-1	1	Bushing, QD, #SH, 1.38B
16	43794-04-9	1	SPRKT, Eagle PD, 140T
17	42294-08-1	1	Bushing, QD, #E, 1.25B
18	60711-01-5	1	Gate, Batch Discharge Assy. – 02400
19	40670-xx-9	1	Motor, 3HP (Voltage Optional)
20	42477-02-9	2	Nozzle, Vee Jet
21	42195-03-9	1	Nozzle, Full Jet
22	43793-02-9	1	Belt, Eagle PD
23	42807-27-9	1	Inverter, 5 HP
24	25665-02-5	2	Grill, pan side – 02421
25	43808-01-9	1	Product Protector (Inlet End)
	59350-01-9		Small Product Protector (Discharge end)

5.1000 PEELING ROLLS

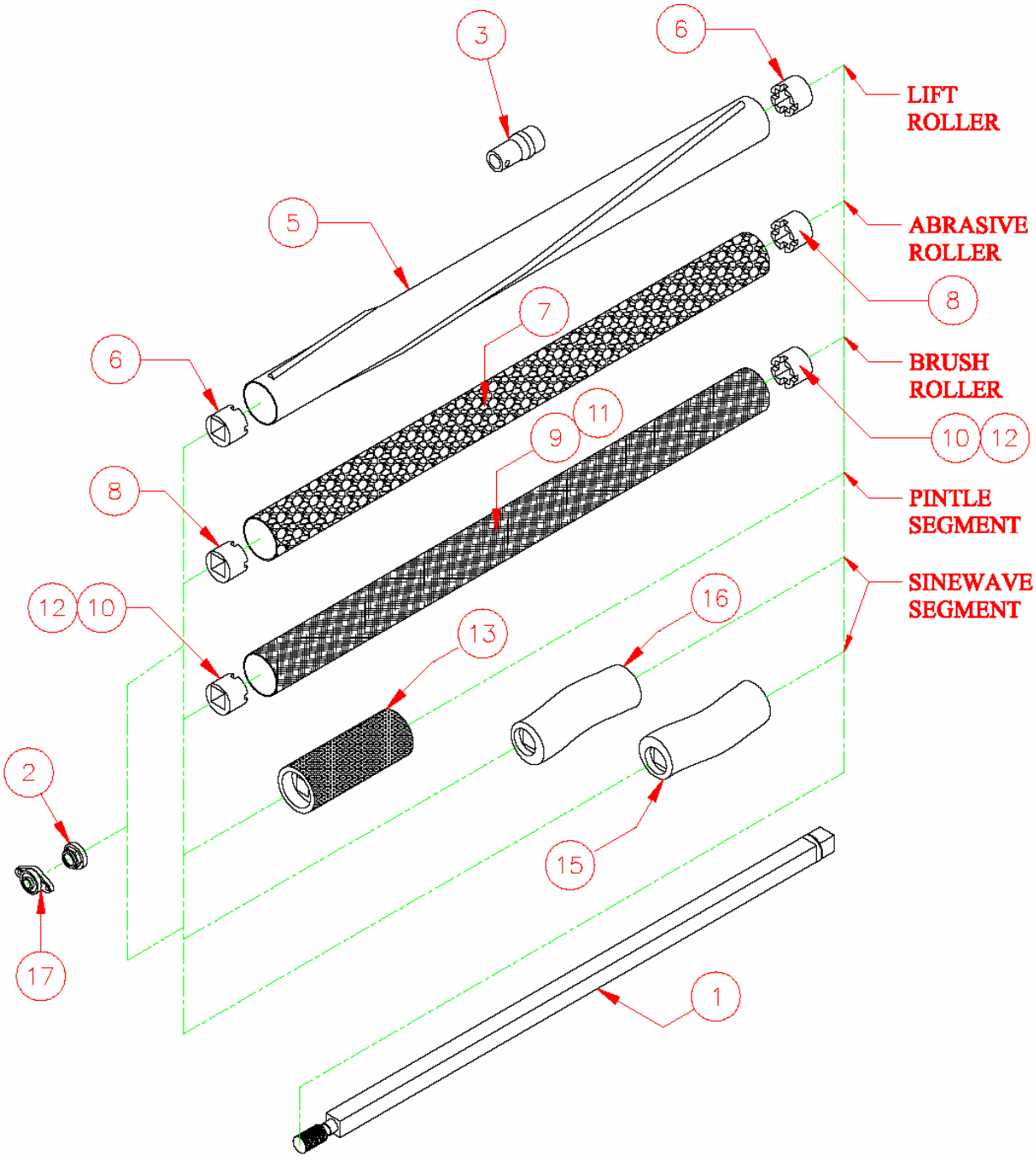


5.1000 PEELING ROLLS

02420 PEELERS

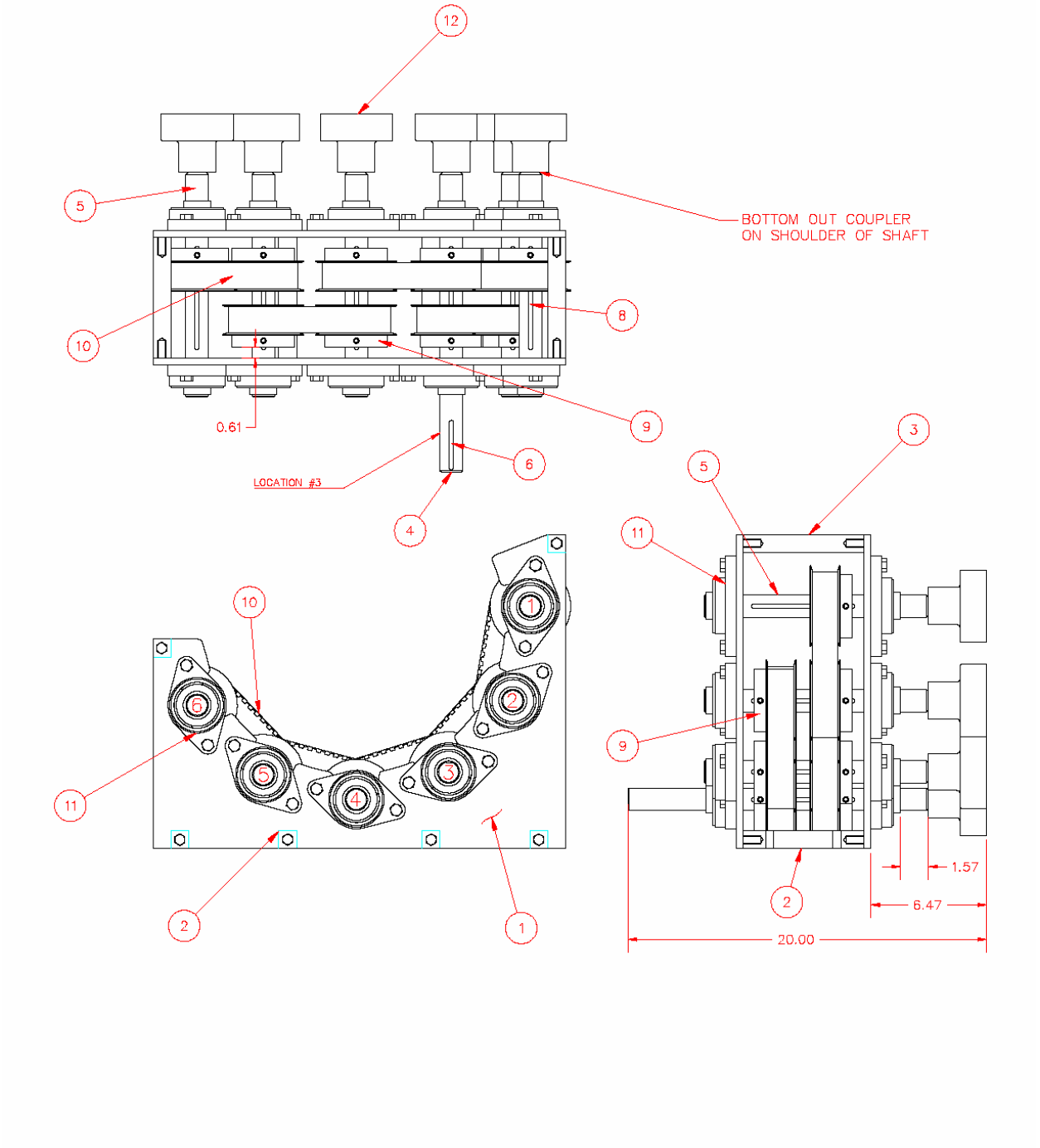
Ref. No.	Part Number	No. Req.	Description
1	20779-02-5	Req.	SHAFT, Peeling Roll
2	20249-01-1	Req.	NUT ASSEMBLY
3	31126-01-9	Req.	SOCKET, Nut Assembly
5	20750-01-5	Req.	ROLL, Lift - LH - 4.50 OD
5	29336-01-5	Req.	ROLL, Lift - Abr - #10 Grit
5	29336-02-5	Req.	ROLL, Lift - Abr - #20 Grit
5	29336-03-5	Req.	ROLL, Lift - Abr - #36 Grit
5	29337-01-5	Req.	ROLL, Lift - Abr - .50- #10 & .50- #20 Grit
6	32485-01-9	Req.	ROLL, Lift End Fixture - 2 / Roll
7	29252-02-1	Req.	ROLL, Abr - .50- #10 & .50- #20 Grit - 4.75 OD
7	29252-04-1	Req.	ROLL, Abr - .75- #10 & .25- #20 Grit - 4.75 OD
7	29316-02-1	Req.	ROLL, Abr - #10 - 4.75 OD
7	29316-01-1	Req.	ROLL, Abr - #20 - 4.75 OD
7	29207-01-1	Req.	ROLL, Abr - #20 Grit - 5.00 OD
7	29207-05-1	Req.	ROLL, Abr - #30 Grit - 5.00 OD
7	29207-02-1	Req.	ROLL, Abr - #36 Grit - 5.00 OD
7	29207-03-1	Req.	ROLL, Abr - #60 Grit - 5.00 OD
7	29207-06-1	Req.	ROLL, Abr - #80 Grit - 5.00 OD
7	29319-01-1	Req.	ROLL, Abr - .67-#20 Grit & .33-#36 Grit - 5.00 OD
8	41129-01-9	Req.	ROLL, Abr End Fixture - 2 /Roll
9	41329-02-9	Req.	BRUSH, .014 – Black/2 Blue stripes
9	43534-08-9	Req.	BRUSH, .026 – Blue/2 Black stripes
9	43738-04-9	Req.	BRUSH, .010 – Black/1 Blue stripes
9	40261-03-9	Req.	BRUSH, .022 – Black/3 Blue stripes
9	40260-03-9	Req.	BRUSH, .045 – Blue/4 Black stripes
9	40347-14-9	Req.	BRUSH, Nylon - .022/.036 60/40
9	43034-01-9	Req.	BRUSH, Abr Tynex A - .022 - #120 Epoxy Filled
10	40259-02-9	Req.	BRUSH, End Fixture - 2 / Roll
11	41566-09-9	Req.	BRUSH, .022 - Random Trim - 3.12 ID
11	42699-01-9	Req.	BRUSH, Abr Tynex A - .040 - #120 - 3.12 ID
12	33740-01-9	Req.	BRUSH, 3.12 ID End Fixture -
13	40369-01-9	Req.	SEGMENT, Pintle Straight Rbr -
13	40369-02-9	Req.	SEGMENT, Pintle Straight Ntrl -
13	40242-01-9	Req.	SEGMENT, Pintle Sine RH Rbr -
14	32118-01-5	Req.	SPACER – Pintle 3.00” O.D. X 1.44
15	31990-01-9	Req.	SEGMENT, Abr Sine - LH - #10
15	31156-01-9	Req.	SEGMENT, Abr Sine - LH - #20
15	33658-01-9	Req.	SEGMENT, Abr Sine - LH - #36
16	31991-01-9	Req.	SEGMENT, Abr Sine - RH - #10
16	31157-01-9	Req.	SEGMENT, Abr Sine - RH - #20
16	33659-01-9	Req.	SEGMENT, Abr Sine - RH - #36
17	41978-06-9	Req.	BEARING, 2 Bolt Flg. 1.00 Bore
18	40261-16-9	Req.	BRUSH, NYLN BLK/BLU 022 (34.75 LG)
18	43926-02-9	Req.	BRUSH, NYLN BLK/BLU 060 (34.75 LG)
18	43813-02-9	Req.	BRUSH, NYLN BLK/NAT 014 (34.75 LG)
18	43534-10-9	Req.	BRUSH, NYLN BLU/BLK 026 (34.75 LG)
18	40260-04-9	Req.	BRUSH, NYLN BLU/BLK 045 (34.75 LG)
18	41566-03-9	Req.	BRUSH, NYLN COM/BLK 022 (34.75 LG)
19	43924-01-9	Req.	SPACER, BRUSH CENTER ADAPTER

5.1000 PEELING ROLLS



02421 PEELERS

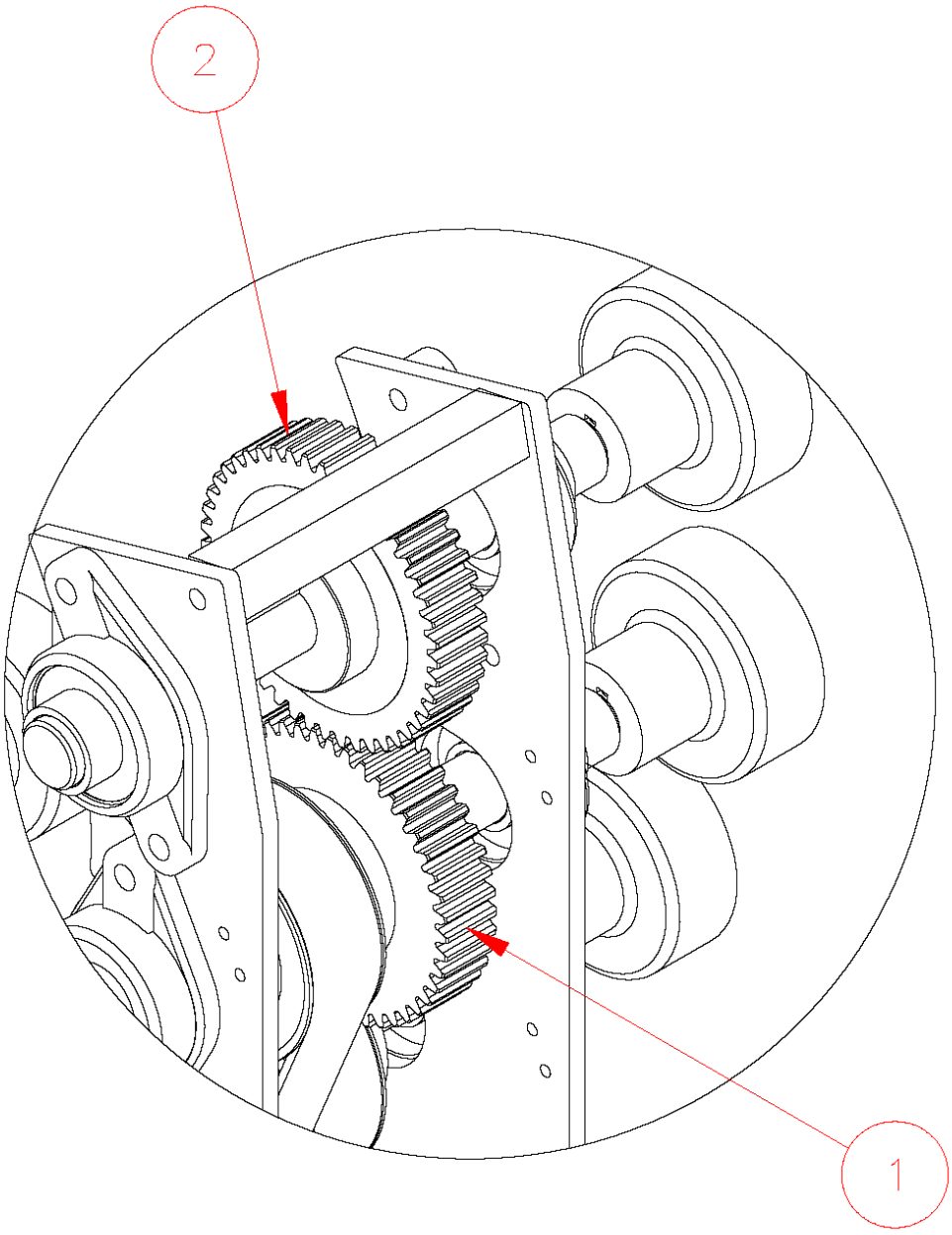
Ref. No.	Part Number	No. Req.	Description
1	20779-03-5	Req.	SHAFT, Peeling Roll
2	20249-01-1	Req.	NUT ASSEMBLY
3	31126-01-9	Req.	SOCKET, Nut Assembly
5	20750-03-5	Req.	ROLL, LIFT LH (34.75)
5	29336-04-5	Req.	ROLL, Lift - Abr - #20 Grit (34.75)
6	32485-01-9	Req.	ROLL, Lift End Fixture - 2 / Roll
7	29207-04-1	Req.	ROLL, ABRSV 5.00 OD #36 GRIT 34.75LG
7	29207-07-1	Req.	ROLL, ABRSV 5.00 OD #20 GRIT 34.75LG
7	29207-08-1	Req.	ROLL, ABRSV 5.00 OD #60 GRIT 34.75LG
7	29207-09-1	Req.	ROLL, ABRSV 5.00 OD #10 GRIT 34.75 LG
8	41129-01-9	Req.	ROLL, Abr End Fixture - 2 /Roll
9	40261-16-9	Req.	BRUSH, NYLN BLK/BLU 022 (34.75 LG)
9	43926-02-9	Req.	BRUSH, NYLN BLK/BLU 060 (34.75 LG)
9	43813-02-9	Req.	BRUSH, NYLN BLK/NAT 014 (34.75 LG)
9	43534-10-9	Req.	BRUSH, NYLN BLU/BLK 026 (34.75 LG)
9	40260-04-9	Req.	BRUSH, NYLN BLU/BLK 045 (34.75 LG)
9	41566-03-9	Req.	BRUSH, NYLN COM/BLK 022 (34.75 LG)
17	41978-06-9	Req.	BEARING, 2 Bolt Flg. 1.00 Bore


12
5
BOTTOM OUT COUPLER
ON SHOULDER OF SHAFT
10
8
9
0.61
LOCATION #3
6
4
3
5
11
10
1
6
2
5
4
3
11
9
2
2
1
1.57
6.47
20.00

5.2000 MECHANICAL DRIVE CASE

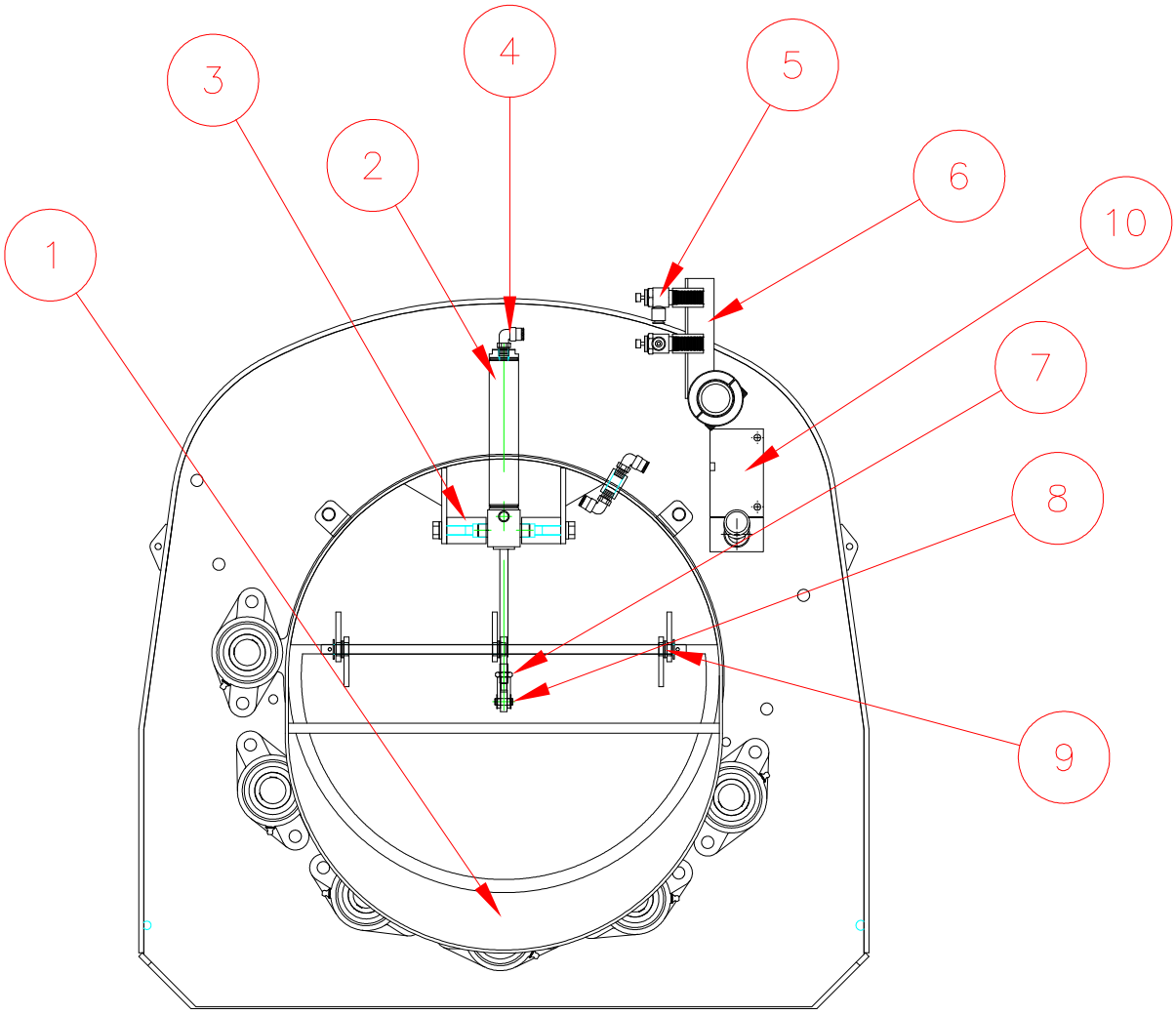
Ref. No.	Part Number	No. Req.	Description
1	39094-01-5	2	PLATE, DRIVE CASE 02400
2	31489-01-5	4	CONNECTOR, 6.75
3	31489-02-5	2	CONNECTOR, 6.75 2 HOLE
4	38947-03-5	1	DRIVE SHAFT, STEEL DRIVE CASE
5	38947-02-5	5	ROLL SHAFT, STEEL DRIVE CASE
6	34185-25-5	1	KEY, .25 SQ. x 2.50 LG SS
7	34185-07-5	6	KEY, .25 SQ. x 1.50 LG SS
8	34185-29-5	6	KEY, .25 SQ. x 5.25 LG SS
9	43731-01-9	14	SPROCKET, POLY CHAIN GT
10	42937-13-9	8	BELT, POLY CHAIN GT
11	40917-04-9	12	BEARING, BALL FLANGE 1.25B
12	40236-01-9	6	COUPLER, URETHANE 1.00B

5.3000 REVERSING ROLLS



Ref. No.	Part Number	No. Req.	Description
1	39115-01-9	1	Spur Gear – Steel, 135MM, 45T
2	39116-01-9	1	Spur Gear – Plastic, 135MM, 45T

5.4000 Batch Discharge Gate



26063

Ref. No.	Part Number	No. Req.	Description
1	26068-01-5	1	Gate, Batch Chute - 2400
2	43995-01-9	1	Cylinder, 1.06B x 4.00 Stroke
3	39262-01-9	2	Mount, Trunion - Air Cylinder
4	43842-02-9	4	Elbow, Poly 90, 0.25 T x .12MPT Swivel
5	40284-04-9	2	Valve, Flow Control, 0.25 NPT
6	26071-01-5	1	Mount, Air Input – 2400
7	43404-02-9	1	Clevis, THD .32-24
8	26069-01-5	1	Pin, Pivot
9	43996-01-9	6	Bearing, Sleeve .375 Polymer W/Flange
10	44005-01-9	1	Valve, 0.25 NPT, 2 Position, Manual

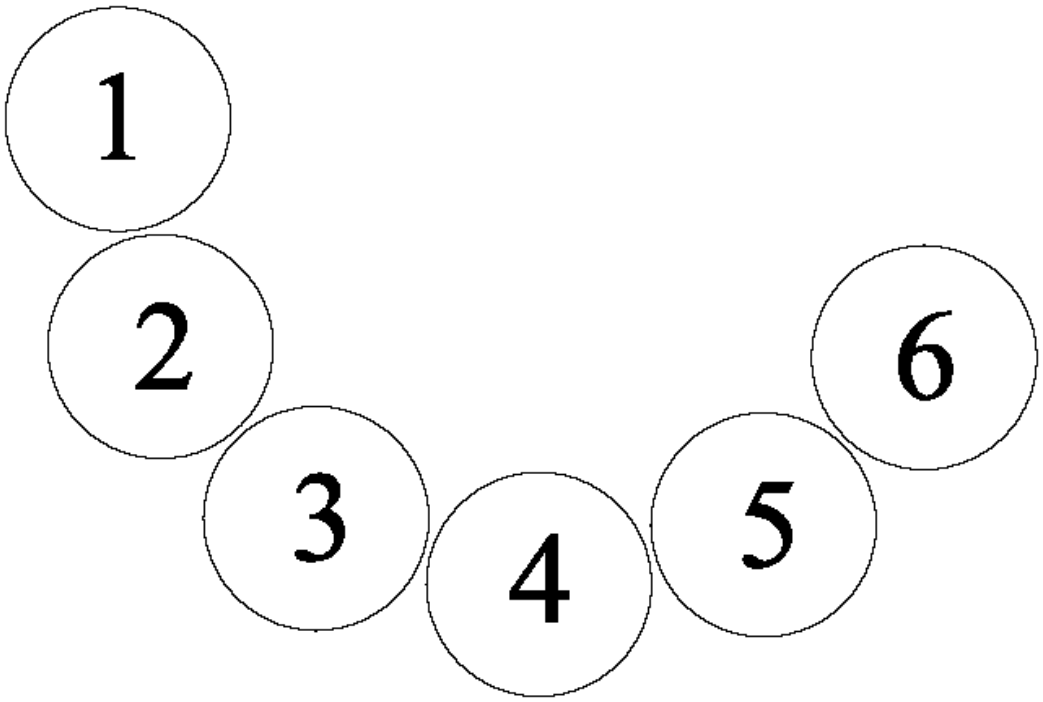
6.0000 SPARE PARTS

Part Number	Est. Qty. / Year Intermit	Cont.	Description
20779-02-5	2	4	SHAFT ASSEMBLY, Peeling Roll
38947-02-5	1	2	SHAFT, Peeling Roller (Steel Drive Case)
38947-03-5	1	1	SHAFT, STEEL DRIVE CASE, DRIVE
20249-01-1	1	2	NUT ASSEMBLY, Peeling Roller
43731-01-9	1	1	SPROCKET, Drive Case Roll
42937-13-9	1	2	BELT, Drive Case Timing
43793-02-9	1	1	BELT, Drive Case Drive Belt
43794-03-9	1	1	SPROCKET, Motor Drive
43794-04-9	1	1	SPROCKET, Motor Driven
41978-06-9	1	2	BEARING, Discharge end 2 Bolt FL. 1.00 B.
40917-04-9	2	2	BEARING, 2Bolt Flange - 1.25 Bore – Drive
40236-01-9	2	2	COUPLER, Drive Shaft to Roll - 1.00 Bore

NOTE: Quantities to have on hand for standard intermittent use are based on a production schedule of eight (8) hours per day, five (5) days per week with at least one year of such usage anticipated.

Quantities to have on hand for continuous use are based on a production schedule of twenty four (24) hours per day, five (5) days per week with at least one year of such usage anticipated.

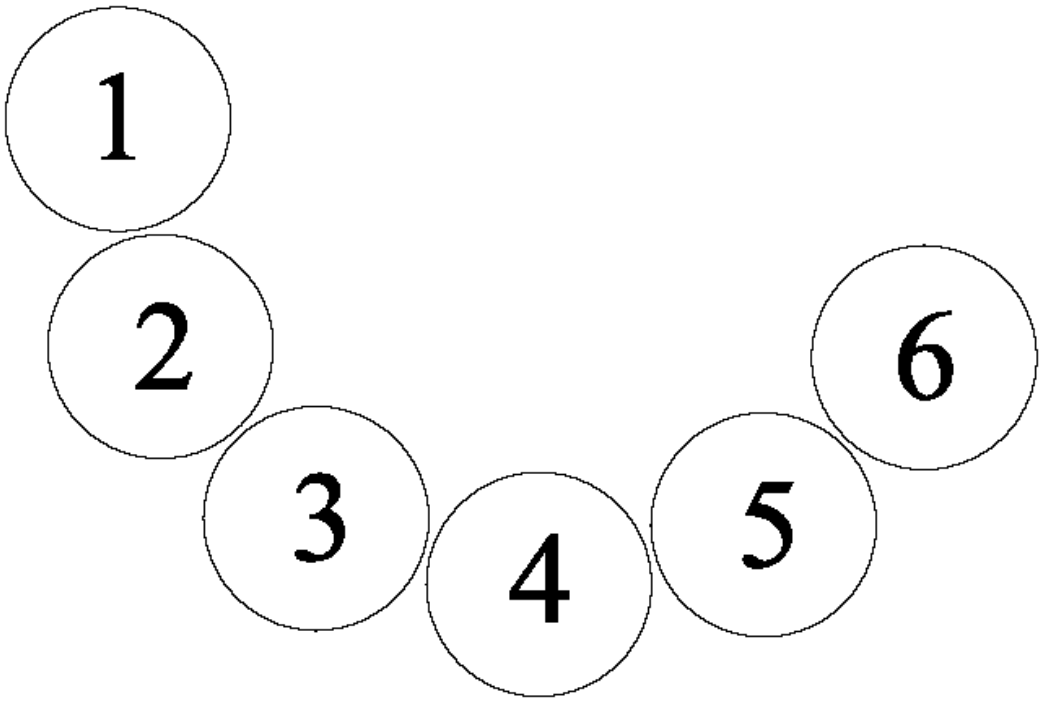
7.1000 PEELING ROLL CONFIGURATION



DISCHARGE END VIEW

ROLL NO.	PART NO.	ROLL TYPE
1.		
2.		
3.		
4.		
5.		
6.		

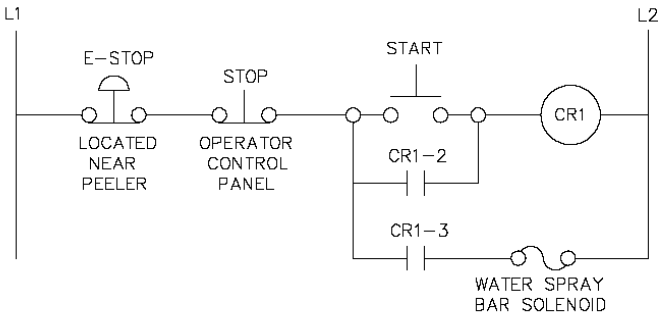
7.1000 PEELING ROLL CONFIGURATION

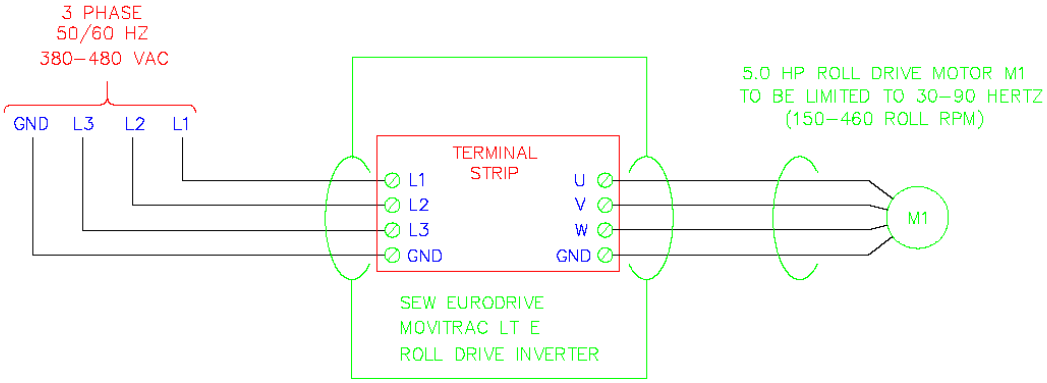


DISCHARGE END VIEW

ROLL NO.	PART NO.	ROLL TYPE
1.		
2.		
3.		
4.		
5.		
6.		

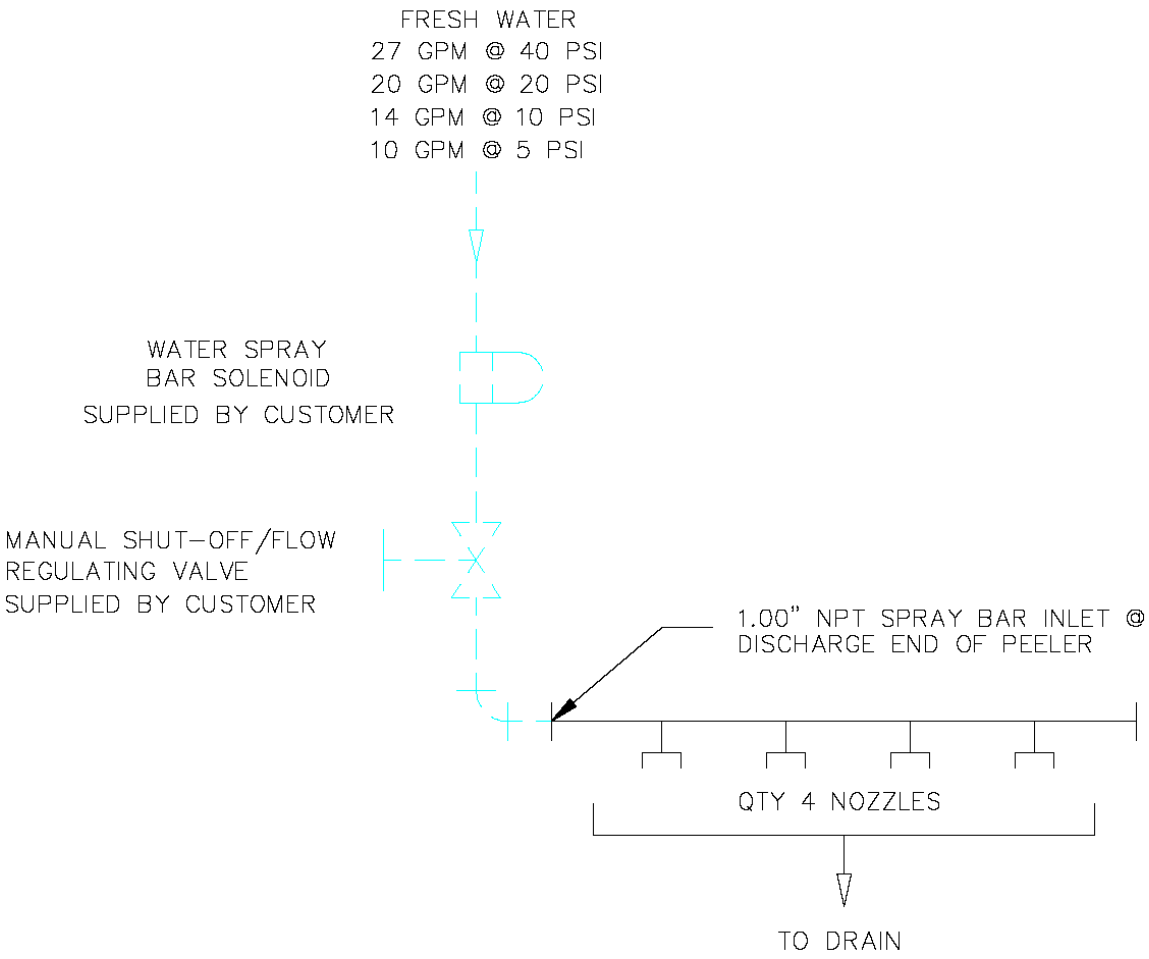
7.2000 RECOMMENDED ELECTRICAL SCHEMATIC





69778-2

7.3000 RECOMMENDED WATER SCHEMATIC



02420 Peeler/Washer

Hz. TO RPM CONVERSION

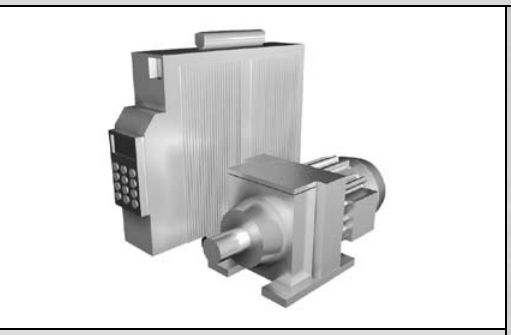
Hz	RPM
20	98
25	122
30	147
35	171
40	195
45	220
50	244
55	269
60	293
65	318
70	342
75	367
80	391
85	415
90	440

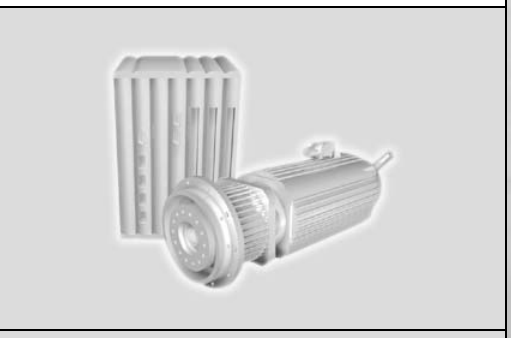
8.0000 COMPONENT BULLETINS

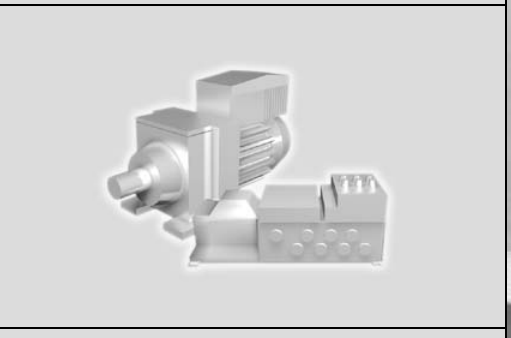
Sew Eurodrive Inverter - 42807-27-9

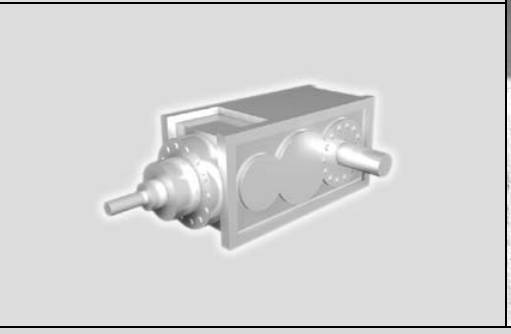
SEW EURODRIVE

42807-27-9







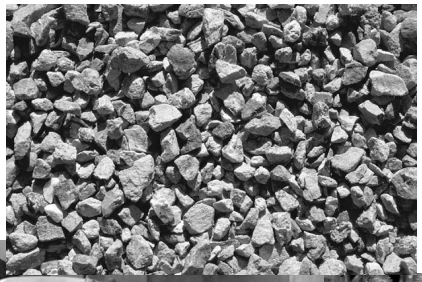


MOVITRAC® LT E

Edition 01/2007

11559810 / EN

Catalog



SEW EURODRIVE

1 Important Notes 4
1.1 Explanation of symbols 4
1.2 Application environment 5
1.3 Waste disposal 5

2 Safety Notes 6

3 Product overview 7
3.1 Technology 7
3.2 Mains supply compatibility 7
3.3 Markets and applications 7
3.4 Accessories available 7

4 General specifications 8
4.1 Input voltage ranges 8
4.2 Product designation 8
4.3 Output power and current ratings 9
4.4 Overload capability 12
4.5 Protection features 12
4.6 Conformance 12
4.7 Environmental 12
4.8 Physical dimensions 13
4.9 User interface 16
4.10 Signal terminals overview 17
4.11 Standard parameters 18
4.12 Extended parameters 19
4.13 P-19 Digital inputs function select 20

5 Accessories 21
5.1 Input filter 21
5.2 Line chokes 22
5.3 Output chokes 23
5.4 DIN rail mounting kit 24
5.5 Second analog input 24
5.6 Second relay output 25
5.7 PI Controller 26

6 Select a motor 27
6.1 Project planning flowchart 27
6.2 Inverter → motor combinations 28

7 Index 29

1 Important Notes

1.1 Explanation of symbols

Danger

Identifies information about practices or circumstances that will lead to personal injury or death, property damage, or economic loss.

Warning

Identifies information about practices or circumstances that may lead to personal injury or death, property damage, or economic loss.

Caution

Identifies information about practices or circumstances that may lead to property damage, or economic loss.

Note

Identifies information that is critical for successful application and understanding of the equipment.

Documentation reference

Operators are made aware of existing documentation, such as operating instructions, catalogs, data sheets.

Unless the information in the operating instructions is adhered to, it will be impossible to ensure:

- Trouble-free operation
- Fulfillment of any rights to claim under guarantee

Consequently, read the operating instructions before you start working with the unit!

The operating instructions contain important information about servicing. Therefore, keep the operating instructions close to the unit.

1.2 Application environment

The following applications are forbidden unless measures are expressly taken to make them possible:

- Use in explosion-proof areas
- Use in environments with harmful substances:
  - Oils
  - Acids
  - Gases
  - Vapors
  - Dust
  - Radiated interference
  - Other harmful environments
- Use subject to mechanical vibration and shock loads in excess of the requirements in EN 50178
- If the inverter performs safety functions which have to guarantee the protection of machinery and people

1.3 Waste disposal

Please follow the current instructions: dispose in accordance with the regulations in force:

- Electronics scrap (printed-circuit boards)
- Plastic (housing)
- Sheet metal
- Copper

2 Safety Notes

Installation and startup

- **Never install damaged products or take them into operation.** Please submit a complaint to the transport company immediately in the event of damage.
- **Installation, startup and service work** on the unit only by **trained personnel**. The personnel must be trained in the relevant aspects of accident prevention and must comply with the regulations in force (e.g. EN 60204, VBG 4, DIN-VDE 0100/0113/0160).
- Follow the **specific instructions** during **installation** and **startup** of the motor and the brake!

- Make sure that **preventive measures** and **protection devices** correspond to the **applicable regulations** (e.g. EN 60204 or EN 50178).

  Grounding the unit is a necessary protective measure.

  Overcurrent protection devices are a necessary protective measure.
- **The unit meets all requirements for reliable isolation** of power and electronics connections in accordance with EN 50178. **All connected circuits** must also **satisfy the requirements for reliable isolation** so as to guarantee reliable isolation.
- Take **suitable measures** to ensure that the connected **motor does not start up automatically when the** inverter **is switched on**. To do this, you can connect binary inputs DI01 through DI03 to GND.

Operation and servicing

- **Disconnect the unit from the supply system** prior to **removing the protective cover**. **Dangerous voltages** may still be present for up to **10 minutes after mains disconnection**.

- **Dangerous voltages** are present at the **output terminals** and the **cables and motor terminals connected to them when the unit is switched on**. Dangerous voltages may also be present when the unit is inhibited and the motor at a standstill.
- The unit is **not** necessarily **deenergized** when the **LEDs and the 7-segment display are off**.

- **Safety functions inside the unit** or a **mechanical blockage** may cause the **motor to stop**. The **removal of the source of the malfunction** or a **reset** can result in an **automatic restart of the drive**. If, for safety reasons, this is **not permissible** for the driven machine, **disconnect the unit from the supply system** before correcting the fault.

3 Product overview

3.1 Technology

The MOVITRAC® LT E range consists of a series of products in two physical sizes designed to provide cost-effective, easy-to-use drives for 3-phase induction motors in the power range 0.37 kW to 4.0 kW (0.5 hp to 5 hp).

The MOVITRAC® LT E employs open loop voltage and frequency control to regulate the speed of the motor. Digital control is combined with the latest IGBT power semi-conductor technology to give a compact, robust solution for general purpose drive applications. The product is designed for ease of use and ease of installation, together with simple programming and commissioning thereby minimising the overall applied cost of a drive solution.

3.2 Mains supply compatibility

The MOVITRAC® LT E is designed for direct on-line connection to world wide supplies. The single-phase 115 V output voltage doubler operates on 115 V mains. The 220 V single phase unit operates on 220 ... 240 V 1 or 3-phase mains, whereas the 380 V 3-phase unit operates on 380 ... 480 V 3-phase mains.

3.3 Markets and applications

The MOVITRAC® LT E product range is aimed at a broad market where general motor speed control is required. Real benefits are offered to both low volume end users and to OEM customers, where the ease of use and the innovative mechanical design significantly reduce commissioning time.

The simple but powerful features make the MOVITRAC® LT E, in combination with the available accessories, suitable for a wide range of applications.

Typical applications are:

- Pumps in the water supply industry, paper industry and sewage systems
- Fan controllers in air conditioning systems, energy saving applications and refrigeration systems
- Compressors in refrigeration systems and compressed air supply systems
- Conveyor belts

3.4 Accessories available

- External EMC filter
- Line choke to reduce supply harmonic distortion and offer additional protection to the drive
- Output choke to improve quality of output waveform and for long motor cables
- PI controller for simple feedback control systems
- Second analog input to switch between two references
- Second relay output for a second programmable relay output
- DIN rail mounting kit

4 General specifications

4.1 Input voltage ranges

Depending upon model and power rating, the drives are designed for direct connection to the following supplies:

MOVITRAC® LT E sizes 1, 2 (115 V input, 230 V output):

115 V ± 10 %, 1 ph, 50 … 60 Hz ± 5 %

MOVITRAC® LT E sizes 1, 2 (240 V):

220 V ... 240 V ± 10 %, 1* ph / 3 ph, 50 … 60 Hz ± 5 %

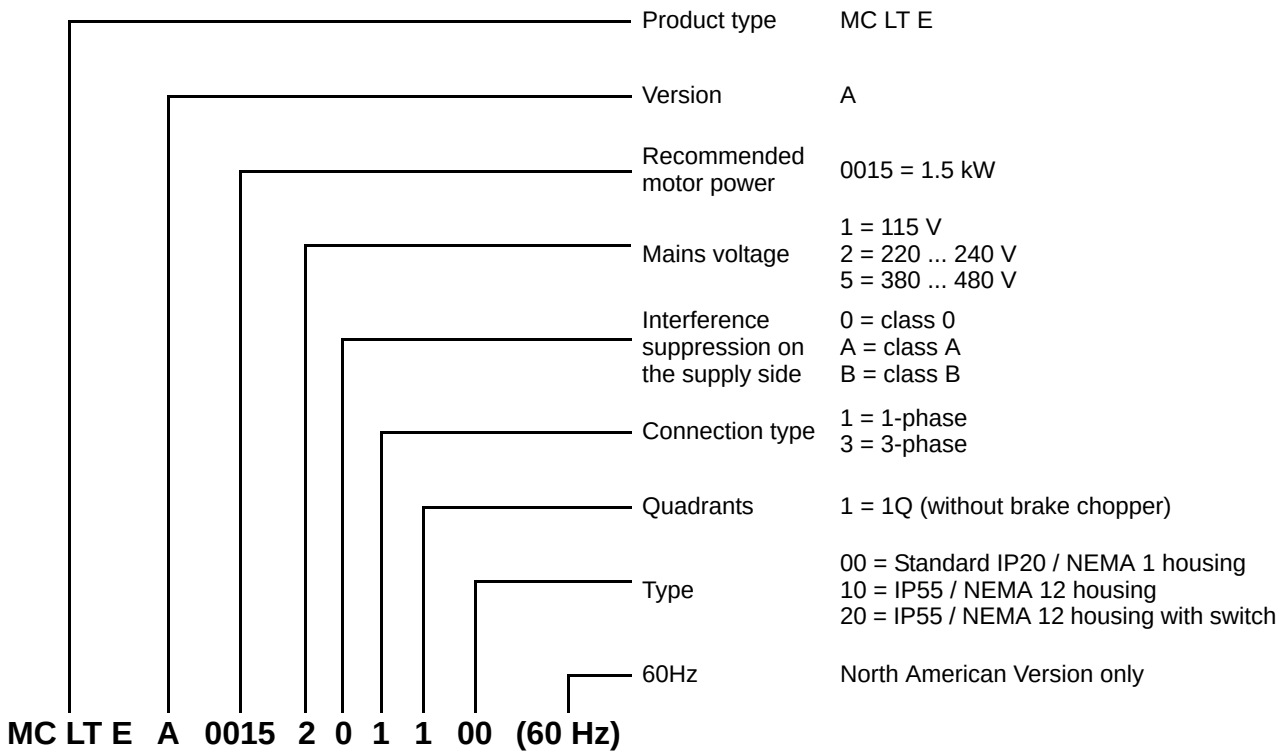
*It is also possible to connect 1-phase MOVITRAC® LT to 2-phases of a 220 ... 240 V 3-phase mains.

MOVITRAC® LT E sizes 1, 2 (480 V):

380 V ... 480 V ± 10 %, 3 ph, 50 … 60 Hz ± 5 %

Products used with a 3-phase supply are designed for a maximum supply imbalance of 3 % between phases. For input supplies which have a supply imbalance greater than 3 % (typically the Indian subcontinent and parts of Asia Pacific including China) we recommend that input chokes are used.

4.2 Product designation


Product type
MC LT E
Version
A
Recommended motor power
0015 = 1.5 kW
Mains voltage
1 = 115 V
2 = 220 ... 240 V
5 = 380 ... 480 V
Interference suppression on the supply side
0 = class 0
A = class A
B = class B
Connection type
1 = 1-phase
3 = 3-phase
Quadrants
1 = 1Q (without brake chopper)
Type
00 = Standard IP20 / NEMA 1 housing
10 = IP55 / NEMA 12 housing
20 = IP55 / NEMA 12 housing with switch
60Hz
North American Version only
MC LT E A 0015 2 0 1 1 00 (60 Hz)

4.3 Output power and current ratings

1-phase system AC 115 V / 0.37 ... 1.1 kW / 0.5 HP ... 1.5 HP / 50/60 Hz

The 115 V drives have an internal voltage doubler so the motor voltage is 220 ... 230 V.

MOVITRAC® LT – EMC filter class 0					
IP20 Standard MOVITRAC®	Type	MC LT E A...	0004-101-1-00	0008-101-1-00	0011-101-1-00
	Part number		8283575	8283583	8283591
IP55/NEMA 12 housing MOVITRAC®	Type	MC LT E A...	0004-101-1-10	0008-101-1-10	0011-101-1-10
	Part number		8290466	8290474	8290482
IP55/NEMA 12 with switch MOVITRAC®	Type	MC LT E A...	0004-101-1-20	0008-101-1-20	0011-101-1-20
	Part number		8290490	8290504	8290512
INPUT					
Supply voltage		V_{mains}	1 × AC 115 V ± 10 %		
Supply frequency		f_{mains}	50 / 60 Hz ± 10 %		
Supply fuse rating		[A]	20	20	30
OUTPUT					
Recommended motor power		[kW]	0.37	0.75	1.1
		[hp]	0.5	1.0	1.5
Output voltage		V_{mains}	220 ... 230 V (voltage doubler)		
Output current		[A]	2.3	5.8	9.5
Motor cable size Cu 75C		[mm^2]	1.0		1.5
		[AWG]	16		16
Max motor cable length	Shielded	[m]	25	100	
	Unshielded		50	150	
GENERAL					
Max. ambient temperature t 8 kHz		[°C]	50	50	50
Size			1	2	

1-phase system AC 220 ... 240 V / 0.37 ... 2.2 kW / 0.5 ... 3 HP / 50/60 Hz

MOVITRAC® LT – EMC filter class 0						
IP20 Standard MOVITRAC®	Type	MC LT E A...	0004-201-1-00	0008-201-1-00	0015-201-1-00	0022-201-1-00
	Part number		8283605	8283613	8283621	8283648
IP55/NEMA 12 housing MOVITRAC®	Type	MC LT E A...	0004-201-1-10	0008-201-1-10	0015-201-1-10	0022-201-1-10
	Part number		8290105	8290113	8290121	8290148
IP55/NEMA 12 with switch MOVITRAC®	Type	MC LT E A...	0004-201-1-20	0008-201-1-20	0015-201-1-20	0022-201-1-20
	Part number		8290199	8290202	8290210	8290229
MOVITRAC® LT – EMC filter class B						
IP20 Standard MOVITRAC®	Type	MC LT E A...	0004-2B1-1-00	0008-2B1-1-00	0015-2B1-1-00	0022-2B1-1-00
	Part number		8283656	8283664	8283672	8283680
IP55/NEMA 12 housing MOVITRAC®	Type	MC LT E A...	0004-2B1-1-10	0008-2B1-1-10	0015-2B1-1-10	0022-2B1-1-10
	Part number		8290156	8290164	8290172	8290180
IP55/NEMA 12 with switch MOVITRAC®	Type	MC LT E A...	0004-2B1-1-20	0008-2B1-1-20	0015-2B1-1-20	0022-2B1-1-20
	Part number		8290237	8290245	8290253	8290261
INPUT						
Supply voltage		V_{mains}	1 × AC 220 ... 240 V ± 10 %			
Supply frequency		f_{mains}	50 / 60 Hz ± 10 %			
Supply fuse rating		[A]	10	10	20	30
OUTPUT						
Recommended motor power		[kW]	0.37	0.75	1.5	2.2
		[hp]	0.5	1.0	2.0	3.0
Output current		[A]	2.3	4.3	7.0	10.5
Motor cable size Cu 75C		[mm^2]	1.0			1.5
		[AWG]	16			16
Max motor cable length	Shielded	[m]	25			100
	Unshielded		50			150
GENERAL						
Max. ambient temperature at 8 kHz		[°C]	50			
Size			1			2

3-phase system AC 380 ... 480 V / 0.75 ... 4.0 kW / 0.5 ... 5 HP / 50/60 Hz

MOVITRAC® LT – EMC filter class 0						
IP20 Standard MOVITRAC®	Type	MC LT E A...	0008-503-1-00	0015-503-1-00	0022-503-1-00	0040-503-1-00
	Part number		8283699	8283702	8283710	8283729
IP55/NEMA 12 housing MOVITRAC®	Type	MC LT E A...	0008-503-1-10	0015-503-1-10	0022-503-1-10	0040-503-1-10
	Part number		8290288	8290296	8290318	8290326
IP55/NEMA 12 with switch MOVITRAC®	Type	MC LT E A...	0008-503-1-20	0015-503-1-20	0022-503-1-20	0040-503-1-20
	Part number		8290377	8290385	8290393	8290407
MOVITRAC® LT – EMC filter class B						
IP20 Standard MOVITRAC®	Type	MC LT E A...	0008-5A3-1-00	0015-5A3-1-00	0022-5A3-1-00	0040-5A3-1-00
	Part number		8283737	8283745	8283753	8283761
IP55/NEMA 12 housing MOVITRAC®	Type	MC LT E A...	0008-5A3-1-10	0015-5A3-1-10	0022-5A3-1-10	0040-5A3-1-10
	Part number		8290334	8290342	8290350	8290369
IP55/NEMA 12 with switch MOVITRAC®	Type	MC LT E A...	0008-5A3-1-20	0015-5A3-1-20	0022-5A3-1-20	0040-5A3-1-20
	Part number		8290415	8290423	8290431	8290458
INPUT						
Supply voltage		V_{mains}	3 × AC 380 ... 480 V ± 10 %			
Supply frequency		f_{mains}	50 / 60 Hz ± 10 %			
Supply fuse rating		[A]	5	10	10	16
OUTPUT						
Recommended motor power		[kW]	0.75	1.5	2.2	4.0
		[hp]	1.0	2.0	3.0	5.0
Output current		[A]	2.2	4.1	5.8	9.5
Motor cable size Cu 75C		[mm^2]	1.0		1.5	
		[AWG]	16			
Max motor cable length	Shielded	[m]	25		100	
	Unshielded		40		150	
GENERAL						
Max. ambient temperature at 8 kHz		[°C]	50			
Size			1		2	

4.4 Overload capability

All MOVITRAC® LT E have a possible overload of:

- 150 % for 60 seconds
- 175 % for 2 seconds

4.5 Protection features

The range of drives can detect and shut down in the event of the following fault conditions arising:

- Output phase - output phase short circuit
- Output phase - ground short circuit
- Output phase over-current trip
- Output current thermal overload (I × t)
- Heatsink thermal overload (trip @ 95 °C)
- DC link over voltage
- DC link under voltage
- External (thermistor) trip

4.6 Conformance

All products conform to the following international standards:

- CE marked for low voltage directive
- IEC 664-1 Insulation co-ordination within low voltage systems
- UL 508C Power conversion equipment
- EN 61800-3 Adjustable Speed electrical power drive systems - Part 3
- EN 61000-6 / -2, -3, -4 Generic immunity/ Emission standards (EMC)
- Enclosure protection level according to NEMA 250, EN 60529
- Flammability rating according to UL 94
- C-Tick
- cUL

4.7 Environmental

Ambient temperature range operational	0 ... 50 °C @ 8 kHz PWM frequency
Ambient temperature range storage	–40 °C ... 60 °C
Max. altitude for rated operation	1000 m
Derating above 1000 m	1 % / 100 m to 2000 m max.
Relative humidity	<95 % (non condensing)
Protection rating cabinet drive	IP20, NEMA 1
Protection rating high enclosure drive	IP55, NEMA 12 k

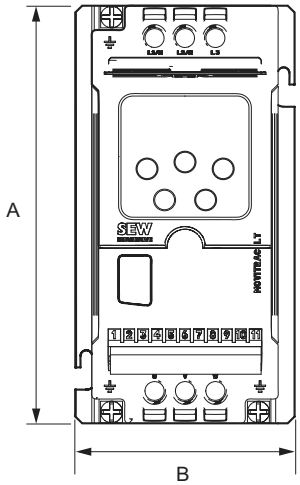
4.8 Physical dimensions

MOVITRAC® LT E is available in 2 housing versions:

- Standard IP20 / NEMA 1 housing for use in switch cabinets
- IP55 / NEMA 12 K version for size 1 and size 2 drives

The IP55 / NEMA 12 K housing is protected against moisture and dust. Therefore, the drives can be operated indoors under harsh conditions. Electronically, the drives are identical and the only differences are the dimensions of the housing and the weight.

4.8.1 Dimensions of the IP20 / NEMA 1 housing



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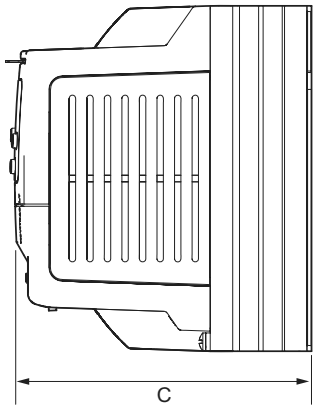

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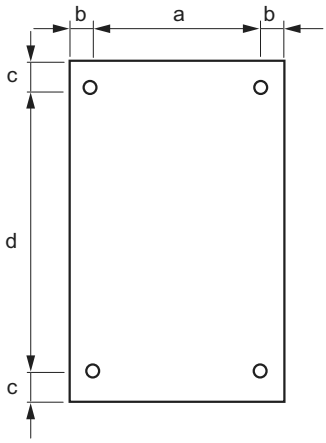

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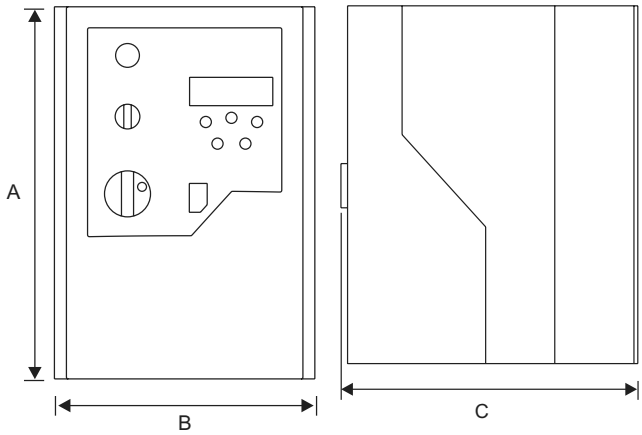
Dimension		Size 1	Size 2
Height (A)	[mm]	155	260
	[in]	6.10	10.20
Width (B)	[mm]	80	100
	[in]	3.15	3.94
Depth (C)	[mm]	130	175
	[in]	5.12	6.89
Weight	[kg]	1.1	2.6
	[lb]	2.43	5.73
a	[mm]	72	92
	[in]	2.84	3.62
b	[mm]	4	4
	[in]	0.16	0.16
c	[mm]	25	25
	[in]	0.98	0.98
d	[mm]	105	210
	[in]	4.13	8.27
Power terminal torque settings	[Nm]	1	1
	[lb.in]	8.85	8.85
Recommended screws		2 × M4	2 × M4

4.8.2 Dimensions of the IP55 / NEMA 12 housing (LT E xxx –10 and –20)



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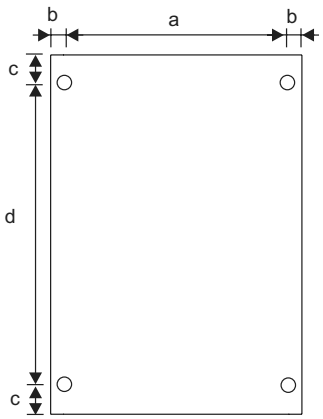

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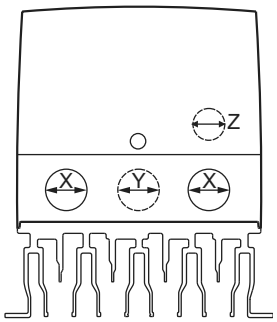

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Dimension		Size 1	Size 2
Height (A)	[mm]	200	310
	[in]	7.9	12.2
Width (B)	[mm]	140	165
	[in]	5.5	6.5
Depth (C)	[mm]	162	176
	[in]	6.4	6.9
Weight	[kg]	2.3	4.5
	[lb]	5.1	9.9
a	[mm]	128	153
	[in]	5	6
b	[mm]	6	6
	[in]	0.23	0.23
c	[mm]	25	25
	[in]	0.98	0.98
d	[mm]	142	252
	[in]	5.6	9.9
X	[mm]	22	25
	[in]	0.87	0.98
Y[1)]	[mm]	22	22
	[in]	0.87	0.87
Z[1)]	[mm]	17	17
	[in]	0.67	0.67
Power terminal torque settings	[Nm]	1	1
	[lb.in]	8.85	8.85
Control terminal torque settings	[Nm]	0.5	0.5
	[lb.in]	4.43	4.43
Recommended screws		2 × M4	4 × M4

1) Glands Y and Z are flip out glands.

4.8.3 IP20 / NEMA 1 housing: mounting and dimensions

For applications that require a higher IP rating than the IP20 offered by the standard drive, the drive must be mounted in a separate housing. The following guidelines should be observed for these applications:

- Housing should be made from a thermally conductive material, unless forced ventilation is used.
- When a vented housing is used, there should be venting above and below the drive to ensure good air circulation. Air should be drawn in below the drive and expelled above the drive.
- If the external environment contains contamination particles (e.g. dust), a suitable particle filter should be fitted to the vents and forced ventilation implemented. The filter must be serviced and cleaned appropriately.
- High moisture, salt or chemical content environments should use a suitably sealed (non-vented) housing.

Dimensions for non vented metal housing

Drive power rating		Sealed housing					
		W		H		D	
		[mm]	[in]	[mm]	[in]	[mm]	[in]
Size 1	0.37 kW 200 V / 115 V	200	7.87	250	9.84	200	7.87
Size 1	0.75 kW 200 V / 400 V	250	9.84	300	11.81	200	7.87
Size 1	1.5 kW 200 V / 400 V	300	11.81	400	15.75	250	9.84
Size 2	0,75 kW 115 V / 1.1 kW 115 V 2.2 kW 400 V	300	11.81	400	15.75	300	11.81
Size 2	2.2 kW 200V / 4.0 kW 400 V	450	17.71	600	23.62	300	11.81

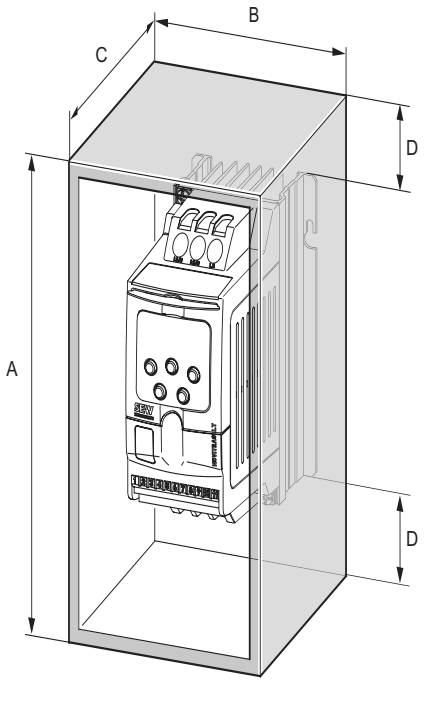


Figure 1: Housing

Dimensions for vented housing

Drive power rating		Vented housing						Force vented housing (with fan)						
		W		H		D		W		H		D		
		[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	Air Flow
Size 1	All ratings	300	11.81	400	15.75	150	5.91	200	7.87	300	11.81	150	5.91	> 15m^3 / h
Size 2	All ratings	400	15.75	600	23.62	250	9.84	200	8.87	400	15.75	250	9.84	> 45m^3 / h

4.9 User interface

Keypad

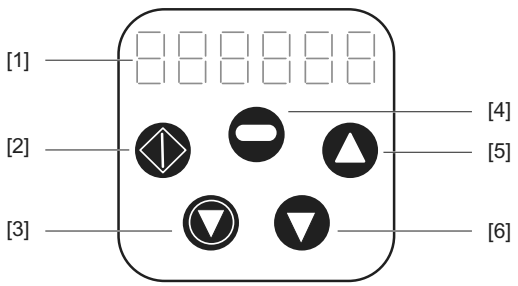
Each MOVITRAC® LT E has an integrated keypad as standard, allowing drive operation and set up without any additional equipment.

The keypad consists of 5 keys with the following functions:

Start / Run	Enable running of motor
Stop / Reset	Stop motor / reset trip
Navigate	Press and hold to enter / exit parameter edit mode
Up	Increase parameter / value
Down	Decrease parameter / value

The Start / Stop buttons on the keypad are disabled when the parameters have their factory default settings. To enable the operation of the Start / Stop buttons on the keypad, set P-12 to 1 or 2 (see chapter 4.11, "Standard parameters").

The Navigate key alone is used to gain access to the parameter edit menu. Pressing and holding this key (> 1 sec) allows the user to toggle between the parameter edit menu and the real time display (where the drive operating status / running speed is displayed). By pressing this key (< 1 sec) the user is able to toggle between the operating speed and operating current during drive operation.



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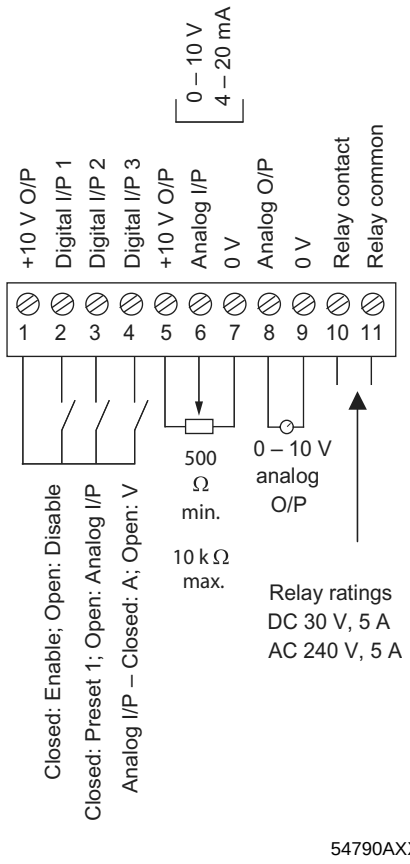
[1]	Display	[4]	Navigate
[2]	Start	[5]	Up
[3]	Stop / Reset	[6]	Down

Display

A standard 6-digit, 7-segment display is integrated into each drive to allow drive operation to be monitored and parameters to be set.

4.10 Signal terminals overview



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The signal terminal block has the following signal connections:

Terminal no.	Description	Connection
1	+10 V ref out	Ref. to activate DI1 ... DI3
2	Digital input 1	Connect to +8 V ... 30 V DC to activate
3	Digital input 2	Connect to +8 V ... 30 V DC to activate
4	Digital input 3	Connect to +8 V ... 30 V DC to activate
5	+10 V ref out	10 V ref for analog input (pot supply +, 10 mA max)
6	Analog input (12 bit)	0 ... 10 V (4 ... 20 mA when Iref enabled)
7	0 V common	0 V ref for analog input (pot supply -)
8	Analog output (10 bit)	0 ... 10 V, 10 V / 20 mA digital programmed
9	0 V common	0 V ref for analog output
10	Relay N.O	N.O. relay contact (AC 250 V / DC 30 V @ 5A)
11	Relay Common	N.O. relay contact (AC 250 V / DC 30 V @ 5A)

All digital inputs activated by input voltage in range +8 V ... 30 V, i.e. +24 V compatible.

Do not apply voltage greater than 30 V to terminals 1 ... 9 because this will result in damage to the controller.

4.11 Standard parameters

Par	Description	Range		Default
P-01[1)]	Max speed limit (Hz or rpm)	max. 500 Hz		50 Hz
P-02[1)]	Min speed limit (Hz or rpm)	0 ... P-01 (max. 500 Hz)		0 Hz
P-03	Accel ramp time (s)	0.0 s … 3000 s		5 s
P-04	Decel ramp time (s)	0.0 s … 3000 s		5 s
P-05	Stop mode select	Ramp to stop / coast to stop		Ramp to stop
P-06	V/F characteristic	0	Constant torque V/f	0 (V/f)
		1	Pump-Fan V/f²	
P-07	Rapid decel ramp time	0.0 s … 25 s (disabled when 0.0 s)		0.0 s
P-08	Motor rated current limit	0 to current rating of drive (Amps)		Rated I-Drive
P-09	Motor rated frequency	25 ... 500 Hz		50 Hz 60 Hz (USA & Canada only)
P-10	Motor rated speed	0 ... 60,000 rpm		0
P-11	Voltage boost	0 ... 25 % of max output voltage		3 %
P-12	Terminal / Keypad control of drive	0	Terminal control	0 (terminal)
		1	Keypad control (fwd only)	
		2	Keypad control (fwd / rev to toggle between fwd and rev using start button)	
P-13	Trip log	Last four trips stored		no fault
P-14	Extended menu access code	0 ... 9999		0

1) If the motor rated speed in rpm has been entered into P-10, parameters P-01, P-02, P-20 ... P-23, P-27 and P-28 are in rpm.

4.12 Extended parameters

Par	Description	Range		Default
P-15	Motor rated voltage	40 V up to mains voltage		0 (motor voltage = mains voltage)
P-16	Analog input V / mA	0 ... 10 V, 4 ... 20 mA, 0 ... 20 mA, 20 ... 4 mA, 10 ... 0 V		0-10 V
P-17	Effective switching frequency	8, 16, 32 kHz		8 kHz
P-18	Relay output function	0	MOVITRAC® LT E enabled	1 Drive healthy
		1	Drive healthy (not tripped)	
		2	Motor at set speed	
		3	Motor at zero speed (<5 % of P-09)	
		4	Motor at max speed (P-01)	
		5	Motor current overload	
P-19	Digital inputs function select	0 to 12, See table in chapter 4.13		0
P-20[1)]	Preset speed 1	P-02 (min) ... P-01 (max)		50 Hz
P-21[1)]	Preset speed 2	P-02 (min) ... P-01 (max)		0 Hz
P-22[1)]	Preset speed 3	P-02 (min) ... P-01 (max)		0 Hz
P-23[1)]	Preset speed 4	P-02 (min) ... P-01 (max)		0 Hz
P-24	Not used			
P-25	Analog output function select	0	Motor speed (analog)	0
		1	Motor current (analog)	
		2	Drive enabled (digital)	
		3	Motor at set speed (digital)	
P-26	V/F characteristic adjustment factor	20 % … 250 % (Used together with P29.)		100 %
P-27[1)]	Skip freq / speed	P-02 (min) ... P-01 (max)		0 Hz
P-28[1)]	Skip freq / speed band	0 up to 100% of base freq (P-09)		0 Hz
P-29	V/F characteristic adjustment frequency	0 Hz up to base frequency (P-09). Function disabled when set to 0. (Used together with P26.)		0 Hz
P-30	Drive start mode	Edge-r	requires the run signal once after trip or power down	Auto 0
	Drive start mode	Auto-0	enables whenever a run signal is applied	
	Drive start mode	Auto-1 ... 4	Inverter will attempt to restart after a trip 1 ... 4 times	
P-31	DC injection voltage	0.1 ... 20 %		10 %
P-32	DC injection braking time(s)	0 ... 250 s		0 s
P-33	DC injection on enable	0	Disable	0
		1	Enable	0
P-34	Not used			
P-35	Analog input scaling factor	1 % ... 500 %		100 %
P-36	Not used			
P-37	Access code definition	0 ... 9999		101
P-38	Parameter access lock	0	All parameters can be changed and are auto- saved on power down	0 (write access and auto-save enabled)
		1	Parameter changes not saved on power down	
		2	Parameter read-only access. No changes allowed.	
P-39	Hours run meter	0 ... 99999 hours		Read only
P-40	Drive identifier software checksum	0000 ... FFFF (hex) Drive rating / software version		Read only

1) If the motor rated speed in rpm has been entered into P-10, parameters P-01, P-02, P-20 ... P-23, P-27 and P-28 are in rpm.

4.13 P-19 Digital inputs function select

The functionality of the digital inputs within the MOVITRAC® LT E is user programmable, allowing the user to select the functions required for the application.

The following tables define the functions of the digital inputs depending on the value of parameter P12 (Terminal / keypad control) and P-19 (Digital input function select).

If P12 = 0 (terminal mode) then use the following table.

P-19	Digital input 1 function	Digital input 2 function	Digital input 3 function
0	Open : Stop (Disable) Closed : Run (Enable)	Open : Analog input Closed : Speed Preset 1	Voltage input Current analog input
1	Open : Stop (Disable) Closed : Run (Enable)	Open : Analog input Closed : Speed Preset 1/2 (Digital input 3 selects)	Open : Speed Preset 1 Closed : Speed Preset 2
2	Open : Stop (Disable) Closed : Run (Enable)	Digital input 2 : open \ Digital input 3 : open / Digital input 3 : open \ Digital input 2 : closed / Digital input 3 : closed \ Digital input 2 : open / Digital input 3 : closed \ Digital input 2 : closed /	→ Selects Speed Preset 1 → Selects Speed Preset 2 → Selects Speed Preset 3 → Selects Speed Preset 4
3	Open : Stop (Disable) Closed : Run (Enable)	External trip input Open : trip, Closed : OK	Open : Analog Input Closed : Speed Preset 1
4	Open : Stop (Disable) Closed : Run (Enable)	Open : Forward Closed : Reverse	Open : Analog Input Closed : Speed Preset 1
5	Open : Stop (Disable) Closed : Fwd Enable	Open : Stop (Disable) Closed : Reverse Enable	Open : Analog Input Closed : Speed Preset 1
6	Open : Stop (Disable) Closed : Run (Enable)	Open : Forward Closed : Reverse	External trip input Open : trip, Closed : OK
7	Open : Stop (Disable) Closed : Fwd Enable	Open : Stop (Disable) Closed : Reverse Enable	External trip input Open : trip, Closed : OK
8	Open : Stop (Disable) Closed : Run (Enable)	Open : Forward Closed : Reverse	Open : Speed Preset 1 Closed : Speed Preset 2
9	Open : Stop (Disable) Closed : Fwd Enable	Open : Stop (Disable) Closed : Reverse Enable	Open : Speed Preset 1 Closed : Speed Preset 2
10	Normally Open (N.O.) Momentarily Close to run	Normally Closed (N.C.) Momentarily Open to stop	Open : Analog Input Closed : Speed Preset 1
11	Normally Open (N.O.) Push to run forwards	Normally Closed (N.C.) Momentarily Open to stop	Normally Open (N.O.) Push to run reverse
12	Open : Stop (Disable) Closed : Fwd Enable	Closed to run Open to activate fast stop	Open : Analog Input Closed : Speed Preset 1

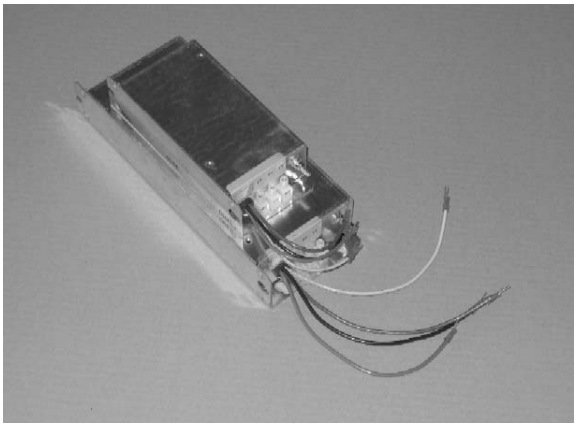
If P12 = 1 or 2 (keypad mode) then use the following table.

P-19	Digital input 1 function	Digital input 2 function	Digital input 3 function
0, 1, 2, 4, 5, 8, 9, 10, 11, 12	Open : Stop (Disable) Closed : Run (Enable)	Closed : Remote up pushbutton[1)]	Closed : Remote down pushbutton[1)]
3	Open : Stop (Disable) Closed : Run (Enable)	External trip input Open : trip, Closed : OK	Open : Keypad speed Closed : Speed Preset 1
6	Open : Stop (Disable) Closed : Run (Enable)	Open : Forward Closed : Reverse	External trip input Open : trip, Closed : OK
7	Open : Stop (Disable) Closed : Run Enable	Open : Stop (Disable) Closed : Reverse Enable	External trip input Open : trip, Closed : OK

1) Closing inputs 1 & 2 at the same time starts the drive.

5 Accessories

5.1 Input filter



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The MOVITRAC® LT E is available with or without an internal EMC filter. The filter option is used where it is required to meet conducted emission standard EN61000-6-3/4. Please note that all MOVITRAC® LT E inherently comply with the EMC radiated emission standards (EN61000-6-2) when good wiring practice is employed.

The internal EMC filters are specified as follows:

- 220 ... 240 V MOVITRAC® LT E with internal filter meet EN61000-6-3 Domestic (Class B)
- 380 ... 480 V MOVITRAC® LT E with internal filter meet EN61000-6-4 Industrial (Class A)

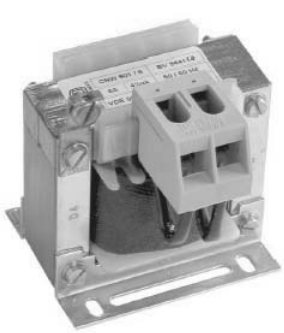
All relevant part numbers are detailed in chapter 4.2, "Product designation".

The external EMC filters can be used for more demanding applications where, for example, the 480 V drive is required to meet domestic (class B) radiated emission requirements. They are specified as follows:

MOVITRAC® LT E size	**1**	**1**	**2**	**2**
Input filter model	NF LT 2B1 010	NF LT 5B3 006	NF LT 2B1 016	NF LT 5B3 016
Part number	18201571	18201601	18201598	18201628
Supply voltage [V] ± 10%	220 ... 240	220 ... 480	220 ... 240	220 ... 480
Phases	1	3	1	3
Max output current [A]	10	6	16	16

5.2 Line chokes

Line chokes reduce supply harmonic distortion and protect MOVITRAC® LT E units against harmful supply disturbances. They are also used to reduce the effects of the MOVITRAC® LT E upon supply harmonic distortion.



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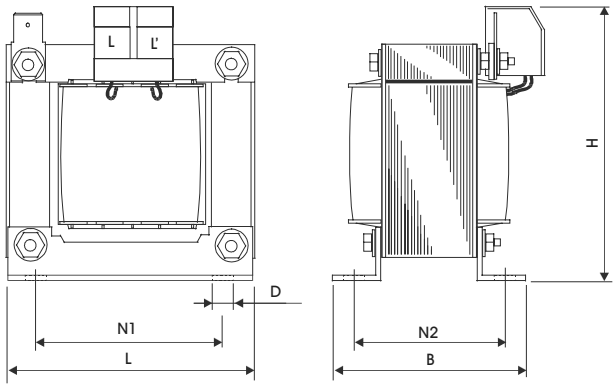

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Line chokes are also used to protect the power input circuits of the MOVITRAC® LT E against voltage spikes which might originate from lightning strikes or other equipment on the same supply.

Type	Part number	MOVITRAC® LT E Size	Rated voltage [V]	Phase	Rated current [A]	Inductance / limb [mH]
ND LT 010 290 21	18201644	1	<230	1	10	2.9
ND LT 025 110 21	18201652	2	<230	1	25	1.1
ND LT 006 480 53	18201660	1	<500	3	6	4.8
ND LT 010 290 53	18201679	2	<500	3	10	2.9

Type	L		B		H		N1		N2		D		Mass	
	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[kg]	[lb]
ND LT 010 290 21	66	2.60	80	3.15	70	2.76	50	1.97	51	2.00	5 × 8	0.2× 0.31	0.8	1.76
ND LT 025 110 21	85	3.35	95	3.74	95	3.74	64	2.52	59	2.32	5 × 8	0.2× 0.31	1.8	3.97
ND LT 006 480 53	95	3.74	56	2.20	107	4.21	56	2.20	43	1.69	5 × 9	0.2 × 0.35	1.3	2.87
ND LT 010 290 53	125	4.92	71	2.80	127	5.00	100	3.94	55	2.17	5 × 8	0.2 × 0.31	2.5	5.51

5.3 Output chokes

Output chokes improve the quality of the output waveform.

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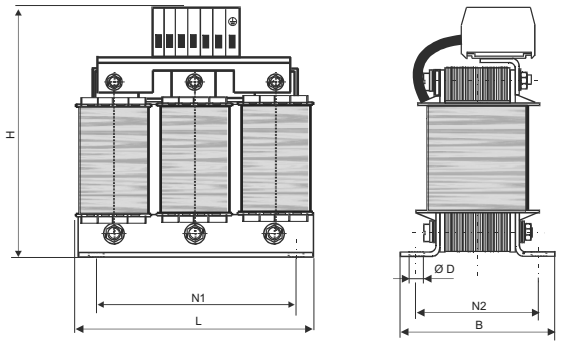

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MOVITRAC® LT E, like the majority of other inverter drives, have unfiltered outputs. In the majority of applications this will give satisfactory performance, however, in a small number of applications output filtering is strongly recommended to improve system functionality, reliability and lifetime.

These applications include:

- High capacitance motor cables
- Long motor cables, up to 300 m
- Multiple motors connected in parallel
- Motors without inverter grade insulation

A range of high quality output chokes are available for MOVITRAC® LT E with the following key features:

- Limits output voltage gradient
- Limits transient over voltages at motor terminals, typically <1000 V
- Suppression of mains conducted interference in lower frequency ranges
- Compensation of capacitive load currents
- Reduction of RFI emissions of the motor cable
- Reduction of motor losses and audible noise caused by ripple

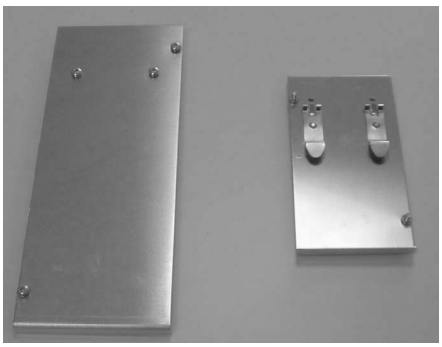
Type	Part number	MOVITRAC® LT E Size	Rated voltage [V]	Rated current [A]	Inductance / limb [mH]
HD LT 008 200 53	18201695	1	500 V	8	2
HD LT 012 130 53	18201709	2	500 V	12	1.3

Type	L		B		H		N1		N2		D		Mass	
	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[kg]	[lb]
HD LT 008 200 53	100	3.94	90	3.54	75	2.95	60	2.37	48	1.89	4	0.16	1.5	3.31
HD LT 012 130 53	125	4.92	115	4.52	85	3.35	100	3.94	55	2.17	5	0.2	3.0	6.61

5.4 DIN rail mounting kit

A mounting kit is available to fit the MOVITRAC® LT E (IP20 / NEMA 1 version only) onto a DIN rail.

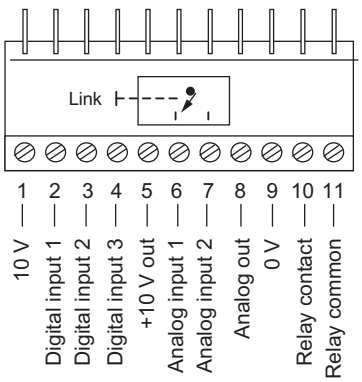
Type	Part number	MOVITRAC® LT E Size
FH LT DINHS 01	18201776	1
FH LT DINHS 02	18201784	2



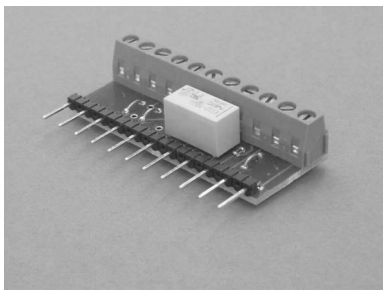
54888AXX

5.5 Second analog input

Type	Part number
OB LT 2ANIN	18201547



54813AXX



54816AXX

This board allows automatic switching between 2 analog references.

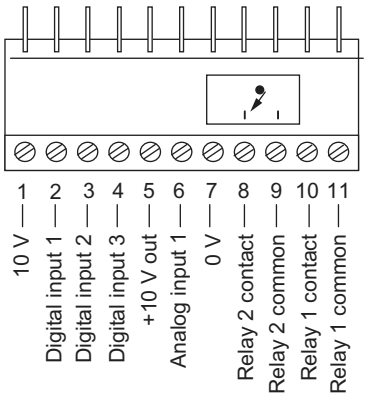
Once this option board has been installed and fully wired into an IP55 / NEMA 12 drive, the board must be bent slightly in a downwards direction to enable the front cover to be closed. This does not affect the function of the option board.

Specification

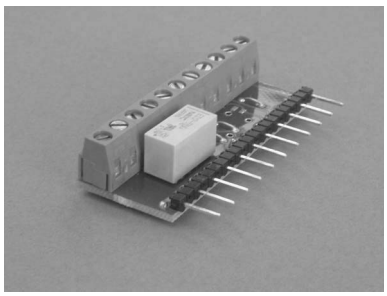
Analog input 1		± DC 10 V or 4 ... 20 mA
Analog input 2		± DC 10 V or 4 ... 20 mA
Conformity		IP00, UL94V-0
Environmental		–10 ... +50 °C
Dimensions	[mm]	56 × 24 (not pins) × 14
	[in]	2.20 × 0.98 (not pins) × 0.56

5.6 Second relay output

Type	Part number
OB LT 2ROUT	18201555


1 — 10 V
2 — Digital input 1
3 — Digital input 2
4 — Digital input 3
5 — +10 V out
6 — Analog input 1
7 — 0 V
8 — Relay 2 contact
9 — Relay 2 common
10 — Relay 1 contact
11 — Relay 1 common

54929AXX



54821AXX

This board provides a programmable second relay output which is controlled using P-25.

The second relay output is controlled using MOVITRAC® LT E Parameter 25:

- P-25 = 2: Relay 2 contacts closed when inverter enabled
- P-25 = 3: Relay 2 contacts closed when inverter at set (requested) speed

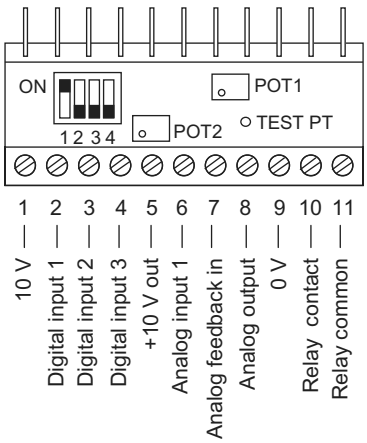
Once this option board has been installed and fully wired into an IP55 / NEMA 12 drive, the board must be bent slightly in a downwards direction to enable the front cover to be closed. This does not affect the function of the option board.

Specification

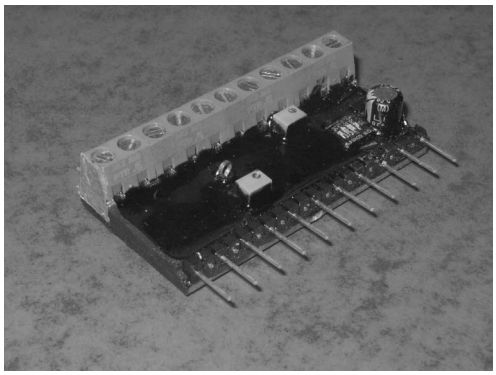
Max. relay switching voltage		AC 250 V / DC 220 V
Max. relay switching current		1 A
Conformity		IP00, UL94V-0
Environmental		–10 ... +50 °C
Dimensions	[mm]	56 × 24 (not pins) × 14
	[in]	2.20 × 0.98 (not pins) × 0.56

5.7 PI Controller

Type	Part number
OB LT PICON	18201563



54835AXX



54832AXX

Key benefits:

- Small physical size
- Potted for robustness and environmental protection
- Minimal setup for quick and easy commissioning
  - integral gain set by 2 switches
  - proportional gain set by potentiometer
- Built in reference potentiometer for convenient setup for feedback reference point.

Once this option board has been installed and fully wired into an IP55 / NEMA 12 drive, the board must be bent slightly in a downwards direction to enable the front cover to be closed. This does not affect the function of the option board.

Specification

Rated reference input		± 10 V or 4 ... 20 mA
Proportional gain range		0.2 ... 30
Rated feedback input		± 10 V or 4 ... 20 mA
Conformity		IP00, UL90V-0
Environmental		–10 ... +50 °C
Dimensions	[mm]	56 × 33 (not pins) × 16
	[in]	2.20 × 1.31 × 0.64

6 Select a motor

6.1 Project planning flowchart

Specify
– Technical data and environmental conditions
– Peripheral conditions
– System interfacing

↓

Calculation of the relevant application data
– Static, dynamic and regenerative power
– Speed

↓

Gear unit selection
– Definition of gear unit size, gear unit reduction ratio and gear unit type
– Check for gear unit utilization ($M_{a\ max} \geq M_{a\ (t)}$)

↓

Motor selection
– Torque and speed reduced to the motor shaft
– Determining the motor

↓

Checking
– Max. torque demand $<1.5 \times M_N$
– Required motor speed $< n_N$
– Thermal load taking into account range and duty cycle

↓

Selecting the MOVITRAC® LT E frequency inverter
– Assignment of motor and inverter
– Continuous power, peak power
– Installation conditions

↓

Accessories / Options
– EMC measures (NF, ND, HD)
– PI controller, 2ANIN, 2ROUT
– DIN rail mounting

↓

Make sure that all requirements have been met.

6.2 Inverter → motor combinations

The tables below are an extract from the SEW-EURODRIVE catalogs for gearmotors.

Motors for 220 V ... 240 V, 50 / 60 Hz connection

SEW-EURODRIVE Motor type	Motorpower [kW]	Motorpower [hp]	Motor rated speed	Inverter type MC LT E ..... -101-x0 MC LT E ..... -201-x0 MC LT E ..... -2B1-x0
DT71D4	0.37	(0.5)	1380	0004
DT71D4 NEMA	0.37	(0.5)	1700	0004
DT80K4	0.55	(0.75)	1360	0008
DT80K4 NEMA	0.55	(0.75)	1700	0008
DT80N4	0.75	(1.0)	1380	0008
DT80N4 NEMA	0.75	(1.0)	1700	0008
DT90S4	1.1	(1.5)	1400	0015
DT90S4 NEMA	1.1	(1.5)	1740	0015
DT90L4	1.5	(2.0)	1410	0015
DT90L4 NEMA	1.5	(2.0)	1720	0015
DV100M4	2.2	(3.0)	1410	0022
DT100LS4 NEMA	2.2	(3.0)	1720	0022

Motors for 380 V ... 480 V, 50 / 60 Hz connection

SEW-EURODRIVE Motor type	Motorpower [kW]	Motorpower [hp]	Motor rated speed	Inverter type MC LT E ..... -501-x0 MC LT E ..... -5A1-x0
DT80K4	0.55	(0.75)	1360	0008
DT80K4 NEMA	0.55	(0.75)	1700	0008
DT80N4	0.75	(1.0)	1380	0008
DT80N4 NEMA	0.75	(1.0)	1700	0008
DT90S4	1.1	(1.5)	1400	0015
DT90S4 NEMA	1.1	(1.5)	1740	0015
DT90L4	1.5	(2.0)	1410	0015
DT90L4 NEMA	1.5	(2.0)	1720	0015
DV100M4	2.2	(3.0)	1410	0022
DV100LS4 NEMA	2.2	(3.0)	1720	0022
DV100L4	3.0	(4.0)	1400	0040
DV100L4 NEMA	3.7	(5.0)	1680	0040
DV112M4	4.0	(5.4)	1420	0040
DV112M4 NEMA	4.0	(5.4)	1730	0040

7 Index

A

Accessories 7, 21
Application environment 5
Applications 7

C

Conformance 12

D

Dimensions 13
IP20/NEMA 1 housing 13
IP55/NEMA 12 housing 14
Non vented metal housing 15
Vented metal housing 16
DIN rail mounting kit 24
Display 16

E

Environment, application 5
Environmental 12
Explanation of symbols 4
Explosion-proof areas 5
Extended parameters 19

H

Housing 13

I

Important Notes 4
Input filter 21
Input voltage ranges 8
Installation 6
Interface, user 16

K

Keypad 16

M

Mains supply compatibility 7
Markets 7
Motor and inverter selection 28
Motor selection 27

O

Operation 6
Output indicators 23
Output power 9
Overload 12
Overview, product 7

P

P-19 Digital inputs 20
Parameters
Extended 19
Standard 18
PI Controller 26
Power, output 9
Product designation 8
Product overview 7
Project planning flowchart 27
Protection features 12

R

Rail mounting kit, DIN 24

S

Safety Notes 6
Second analog input
Analog input 24
Second relay output
Relay output 25
Select a motor 27
Servicing 6
Signal terminals overview 17
Specifications 8
Standard parameters 18
Startup 6
Symbols, explanation 4

T

Technology 7

U

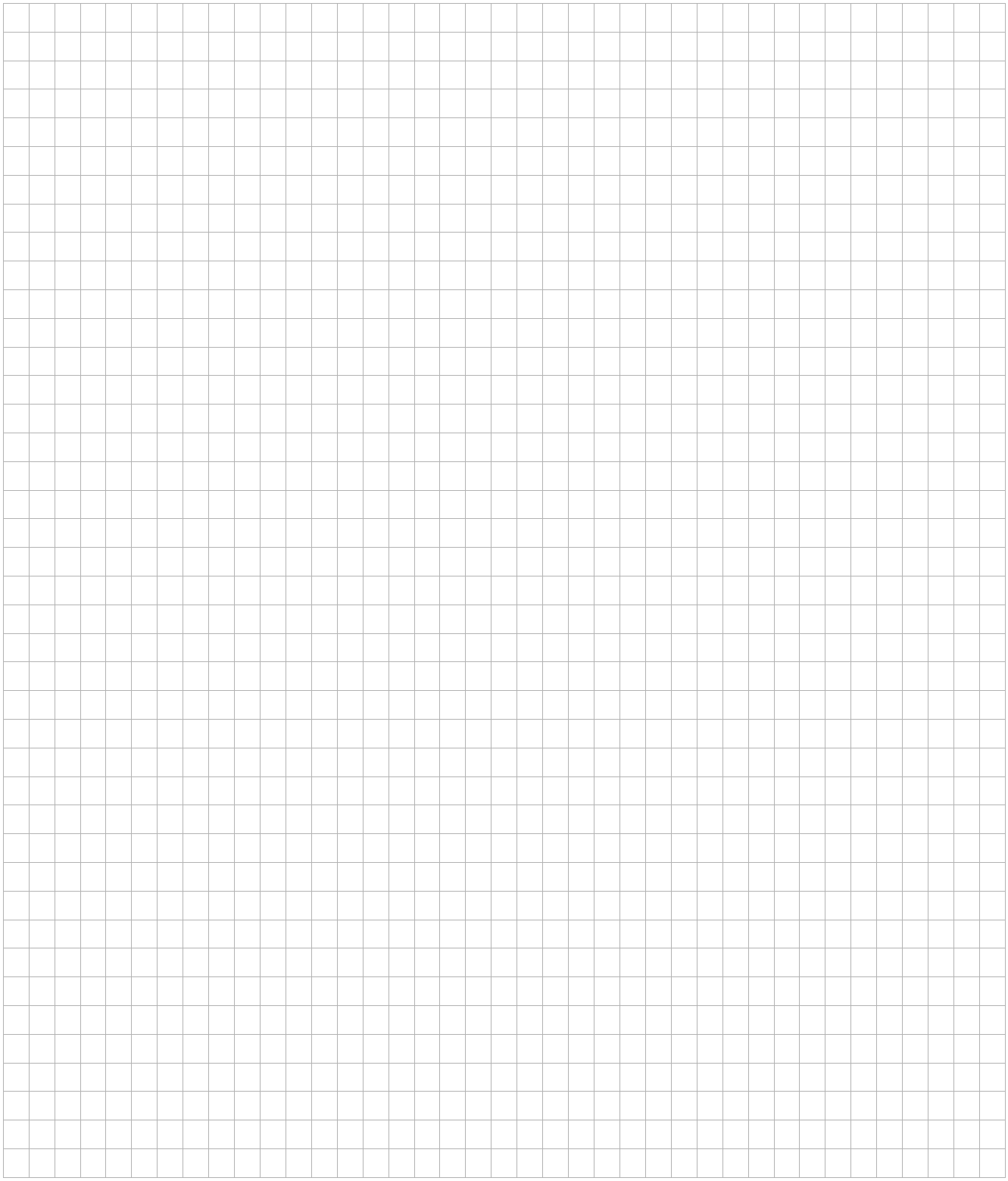
User interface 16

V

Voltage ranges, input 8

W

Waste disposal 5



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EURODRIVE

How we're driving the world

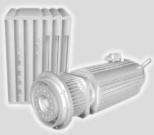
With people who think fast and develop the future with you.

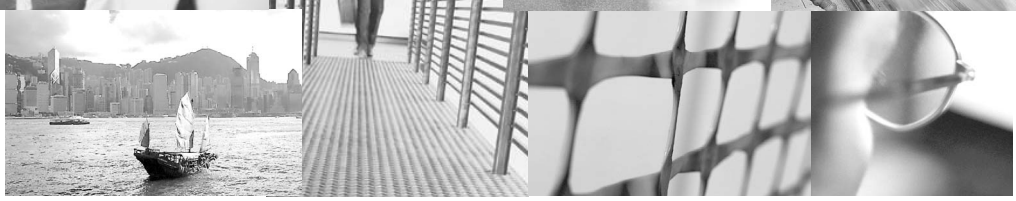
With a worldwide service network that is always close at hand.

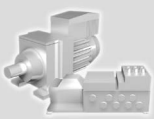
With drives and controls that automatically improve your productivity.

With comprehensive knowledge in virtually every branch of industry today.

With uncompromising quality that reduces the cost and complexity of daily operations.







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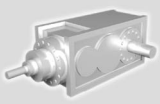

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